

FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

No. 434. (No. 16, Vol. IX.)

APRIL 19, 1917.

Weekly, Price 3d.
Post Free, 4d.

Flight.

Editorial Office: 44, St. MARTIN'S LANE, LONDON, W.C.2.

Telegrams: Truditur, Westrand, London. Telephone: Gerrard 1828.

Annual Subscription Rates, Post Free.

United Kingdom .. 15s. 2d. Abroad 20s. 6d.

CONTENTS.

	PAGE
Editorial Comment:	
The Supremacy of the Air	359
American Air Squadrons for France	360
Reprisals	360
A Signal Honour for the Air Services	362
The "Totally Enclosed" Aeroplane	363
The Royal Aero Club. Official Notices	366
The Roll of Honour	367
Identification of German Aeroplanes	368
Notes from Paris. By D. W. Thorburn	370
Answers to Correspondents	371
Airisms from the Four Winds	373
Personals	375
The British Air Services	376
The Use and Abuse of Steel. By Lt.-Col. R. K. Bagnall-Wild and Lieut. E. W. Birch	378
Air Work in the Advance	379
Aircraft Work at the Front. Official Information	380
The Society of British Aircraft Constructors, Ltd.	382
Model Clubs Diary and Reports	382

EDITORIAL COMMENT.

SINCE we last wrote on the subject of the supremacy of the air, although that was only a week ago, much has happened to reassure those who have followed the course of the war in the air with some little apprehension. The great victory of Arras has come between, and the stories that have been allowed to appear regarding the magnificent work of the Flying Services indicate that our aviators were very definitely "on top" of those of the enemy. Then, we have had the assurances of the Canadian Prime Minister and of General Smuts that at last all is well. Presumably, they spoke out of knowledge confided to them by the War Cabinet, and we may therefore take it that a good deal has been done recently to redress the balance which was so manifestly against us at the opening of the 1917 campaign. So far, so good.

Apparently, the impression has been fostered that those who have felt it their duty to point to obvious shortcomings—and we number ourselves among them—have directed their criticisms against the *personnel* of the Flying Services. For example, even Gen. Smuts, in a speech delivered at Edinburgh,

saw fit to deplore the "carping criticism" that was being levelled against the Air Service, which, he said, was calculated to take the heart out of the young flying officers. We, for our own part, have never on any single occasion found fault with the *Air Services*, nor to the best of our recollection have we seen since the beginning of the war one single word reflecting upon the flying *personnel* of the Service, published in any responsible journal. What has been criticised, and very justly, has been the muddled administration which has resulted in our aviators being sent out to do their work with too great a proportion of obsolete and relatively inefficient machines, and with an insufficient number of them in certain stages of the war. That they have done so well with the material they were given is a fully sufficient tribute to their skill and gallantry, which has never been called in question.

Certainly as recently as the end of January our men were handicapped by having to oppose old machines to the latest designs of the enemy. As the *Daily Mail* points out in a very temperate leading article, we should have known more than we did about the great German retreat if it had not been for this handicap. Severe as the latter was, our airmen nevertheless kept themselves well informed of the construction of new enemy lines in rear, but when the retirement actually took place it was to a great extent unobserved. The *Mail* is perfectly correct when it says that three times during the past two years the Germans have produced a new and improved machine before we were ready with aeroplanes of equal quality, which is tantamount to saying that there was more foresight and energy in the command of the enemy air service than in the control of our own. On each occasion the R.F.C. has had to fight for its life while our authorities were getting our new machines ready. We have no desire to continue in the path of criticism for the mere pleasure of criticising, but we really must point out that the strictures which have been passed upon the administration of the Air Services in the past have produced the effect of awakening the responsible authorities to a sense of their duty, and in the latest reports from the Front, relating to the work of the Air Services, we see the reflex of that awakening. It is all very well for General Henderson—for whom, incidentally, we have the very greatest respect—to tell us that "every time the bell rang the Flying Corps was just about there." Everyone knows that. The point is that

the *men*, to their everlasting honour, were there and ready to take all and every risk, but the *machines* have not always been there either in the number or the quality to give them their proper chance. And before we leave the matter of General Henderson's statements, there is just one little matter we should like cleared up. In inaugurating the Countess of Drogheda's exhibition at Birmingham he is reported to have said that: "Neither command nor mastery of the air had ever existed." General Smuts, at Edinburgh, having just returned from the Western Front, said: "We have the mastery of the air." It is a little difficult to reconcile the two *obiter dicta*. In fact, we find it impossible, but perhaps there is some way, which escapes us, of getting them to march together.

However, we take heart from the statement of Sir Robert Borden, who has told us that the average efficiency of our machines now in use is equal to the average efficiency of the German machines. We look to the Air Board to see that the position does not get any worse than that. We are entitled to expect that much. If we can do better it will be so much to the good—the superior skill and daring of our *personnel* will do the rest. We sincerely believe that the authorities are now doing their best to keep abreast of requirements. The appointment of General Brancker to be Assistant Director-General of Air Services and the determination which we believe has been arrived at to wipe out the foolish policy of sticking to old designs, are signs of a new spirit from which much is to be hoped. No one will be more pleased than we if the necessity for criticism shall have departed, like so many other things, for at least the duration of the war.

American Air Squadrons for France.

Although the United States is now an Allied nation, possessing almost unlimited potentialities for the assistance of the cause for which we have been fighting for nearly three years, it will still be many months before she can make the full weight of her military power felt on the battlefields of Europe. America is in very much the same position that we were at the beginning of the war. Her regular army is small, maintained only for police purposes, and she is faced with the problem, as we were, of creating an active service army of dimensions worthy of her status as a Great Power. She will accomplish it—as we did—but the process will naturally take time, and it must be many months before the first of the new American Armies are ready to take the field against the enemy of civilisation. In all probability it will not be before the beginning of 1918 that we shall see them definitely in the field. It is as well that we should realise this, in order that we may be under no misapprehension as to the magnitude of the task that lies before us. But if the full measure of the strength of the United States cannot be put forth at once, there are other things that she can do for the helping of the common cause. These we may depend upon it she will do to the utmost of her power.

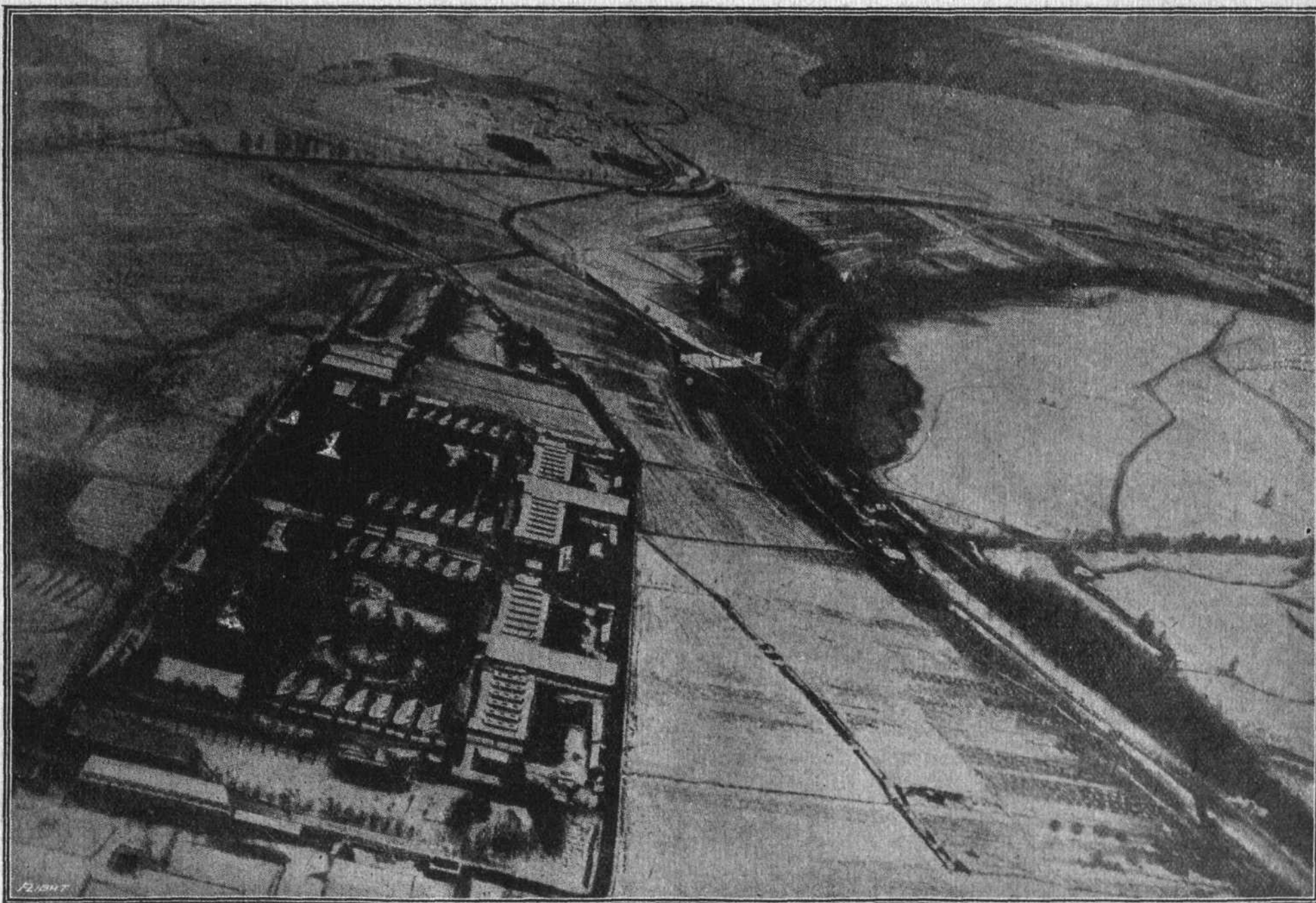
The first manifestation of American good will to help concerns us very closely. It is probable—practically certain—that the first contribution America will make to the fighting strength of the Allies, apart from the services of her magnificent Navy, will take the shape of the despatch to Europe of a number of aeroplane squadrons. According to the news that reaches us by cable, a very strong movement is on

foot to recruit 5,000 American aviators for immediate service in Europe. Interviewed on the subject by the New York correspondent of the *Daily Telegraph*, Mr. Woodhouse, a governor of the Aero Club of America and of the National Aerial Coast Patrol Commission, said:—

"I have sounded public opinion as to the sending of a large number of aviators to fight with the Allies, and I find general and enthusiastic approval of the plan. There will be no trouble to get 1,000 volunteers to make up American aero squadrons to be sent to Europe. I rather believe there will be many times more applications than are wanted. Students from about 20 universities, including Yale, Harvard, Columbia, Princeton, Cornell, Georgia, and the Institute of Technology, are already forming units of the Aerial Coast Patrol, and we have 1,000 applications for aviation training on the file. There will be no trouble whatever in getting the aeroplanes and equipment needed to train and equip these men, it would take about 90 days to establish camps and to give the students their preliminary training, including the theory of flight, aerial gunnery, discipline, &c. By that time our American aeroplane factories will be turning out aeroplanes by the hundred. Within six months they will be turning out aeroplanes by thousands. Everything depends upon the prompt action by the Government, reinforced by the general public. With such facilities as we can provide, there is no reason why numerous squadrons, fully trained and completely equipped, should not leave New York within six months, ready for the service training which can only be given on the field of battle."

All the news goes to show that the idea is being taken up with the enthusiasm which might be expected in the country which gave practical birth to dynamic flight. While it does not, up to the time of writing, appear to have received the *cachet* of formal administrative approval, there is little doubt but that this will be given, and in the meantime the work of recruiting aviators in anticipation is proceeding apace. We could not ask a more acceptable token of the determination of our newest Ally to get on with the business of defeating the enemy than the fruition of this idea. Apart from the very great moral effect of seeing the flag of the United States early in the field, the material help that would be afforded to the Allies in the West by a really strong contingent of the American Air Service would be very great. While we have no dearth of recruits for our own Flying Services, and do not anticipate any, it is nevertheless true that the wastage is appallingly heavy, and will doubtless tend to become even heavier as the campaign approaches its decisive stages. Therefore, we want all we can get, and the American accession to the Allied air strength will be correspondingly welcome.

At last our authorities have brought **Reprisals.** into operation the new policy recently announced, and which we and others have constantly urged, by beginning to meet German "frightfulness" in kind. The news that the open town of Freiburg has been bombed by British and French aeroplanes in reprisal for the sinking of British hospital ships is very welcome, for the main reason that we are convinced that the only way to touch the sensibilities of the Hun is by "strafing" him in his own person. The Manual of Military Law lays down that reprisals are "a means of making the enemy comply in future with the recognised laws of war." The Germans have never, since the beginning of hostilities, paid the slightest heed to the "recognised laws of war," while we on our side have been scrupulous in our regard for them, even when such regard militated badly against our own interests. Knowing this, the Germans have been out to take the fullest advantage of our weak regard—as they see it—for



A remarkable photograph of Verdun Barracks, taken from a French service aeroplane. This picture conveys some idea of what the eyes of the army can see and bring back to headquarters for guidance of the staff. Note, in the centre of the picture, the other aeroplane flying.

By courtesy of "La Guerre Aérienne."

FLIGHT

established usage, with the effect that we have suffered while they have reaped the advantage. However, there is an end to all things—even to British patience—and we sincerely hope that now the policy of reprisal has been inaugurated it will be ruthlessly applied until the Hun has been compelled to the

knowledge that "frightfulness" only pays so long as it is in the nature of a monopoly.

It is to be hoped that steps are being taken to ensure that the German public clearly appreciate the reason for the bombardment of such a city as Freiburg.



A SIGNAL HONOUR FOR THE AIR SERVICES.

THE announcement that His Majesty the King has assumed the title of Colonel-in-Chief of the Royal Flying Corps—which for the purpose includes the Royal Naval Air Service—conveys a signal honour to a gallant service. That the King should thus honour a junior service—junior in point of age, that is—is surely unique, except in the case of the regiments of the Household Brigades.

It would be the merest impertinence to offer any further comment than to say that this high honour has been well earned and is thoroughly deserved, and as much for that as for the honour itself we congratulate the Corps. Is it, by the way, an omen pointing to the formation of that much-to-be-desired Air Service as a third and separate branch of Imperial defence, which has been so strongly advocated in the past by "FLIGHT?"



SOUVENIR HUNTING AND ACCIDENTS.

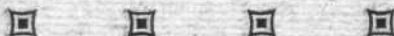
MAN is a collector by nature. From multi-coloured bits of bright fragments of broken pots and plates to Old Masters or rare china vary his collection according to his age or station in life. One will treasure an old book full of all sorts and descriptions of stamps. Another, who may see nothing attractive in these, will perhaps be accumulating all manner of weapons and utensils gathered from far corners of the world. That the collecting trait in human nature should also manifest itself in so young a branch of science as aviation is only to be expected, and so long as this hankering only runs to keeping some part or other of a machine one has crashed during school days, or some equally harmless keepsake of sentimental value, we have every sympathy with the collector. There is, however, another type of souvenir collector with whom we have no patience. Whenever a machine has been badly smashed there is instantly a rush of people to the wreck, some of whom are, of course, only concerned with getting to the unfortunate passengers as quickly as possible and render any aid necessary. But there are undoubtedly others who, as soon as the occupants of the machine have been removed, get busy searching among the wreckage for some little part to carry off as a "souvenir." Apparently the worse the smash the greater the value of the "souvenirs" to these morbid collectors. However, if there were not a more serious and much more practical side to the question, we should scarcely have deemed it of sufficient importance to make any mention of a thing so well known to everybody associated with aviation. The other side of the question, which has not, apparently, been fully realised yet, is that by removing part or parts of a broken machine evidence may be destroyed which would otherwise have given a clue to the cause of the accident. Since it has been our experience that talking generalities does not get home like a specific example, we will take one such concrete case to illustrate our point.

Some time ago a new fast machine was being tested at one of the home aerodromes on a very windy day. The pilot had been in the habit of making very steeply banked left-hand turns, so short, in fact, that the machine appeared to turn in about four times its own length, and in so doing was frequently banked beyond the vertical. This manoeuvre had been repeatedly carried out on calm days and in a moderate wind. On this particular day the wind not only amounted almost to a gale, but was of a decidedly gusty character. From what we can learn the pilot started on his usual sharp left turn while going down wind. As he had almost completed the turn and was heading into the wind one of the upper wings was seen to fly back at an angle, and was soon followed by the lower wing on the same side. The machine, in coming down at a terrific speed, crashed through the roof of a shed and was, of course, totally wrecked, the pilot being killed instantly. The broken wings came down some

distance away, and as the first thought of the people to whom the machine belonged was naturally to rush to the spot and render any aid in their power to the unfortunate pilot, the loose wings, in the excitement, were forgotten until later on. When they came to be examined it was found that some very important parts of them were missing, and a thorough search of the ground around the place of the accident failed to show any trace of them. Several eye-witnesses are positive that they saw a piece of the top covering of the upper wing blow off first, before the wings broke.

The probabilities are that the machine, which would have its air speed momentarily increased to a very great extent through turning comparatively suddenly from a down-wind to an up-wind course, met a head-on gust just as the relative air speed was highest, and that the resulting pressure, being in the nature of a sudden blow, ripped a portion of the fabric off the top surface of the upper wing, which is, of course, the more heavily loaded. All the probabilities are in favour of this explanation, but in view of the missing parts of the broken wings, which, there can be little doubt, have been picked up by somebody, it is impossible to arrive at a definite conclusion. If all the parts had been available there is every probability that it would have been possible to reason the matter out conclusively and logically, and to have shown that, as a matter of fact, the fabric gave first, and then naturally the wind pressure on the wing structure would soon tear the wing away. As it is, one can only surmise that this is what happened, but there is no concrete proof of it, and it is only the corroborative evidence of several eye-witnesses which lends weight to this explanation.

This is of such moment that it is time to speak out very emphatically, and point out that in a degree this morbid fancy for souvenir hunting, however unintentional, in design, is really at the present stage of aviation a crime against human life. Through inability to trace the cause of the wing breakage other pilots' lives may be sacrificed, since every manufacturer of aeroplanes would have benefited by a technical analysis of the causes of the accident, not to mention the fact that immense harm may have been done to the reputation of any firm whose machine is involved in the accident. It is little satisfaction to know that machines of official design have also been known to break their wings in the air. Once let a privately built machine do this, and it is extremely hard to live down, as more than one constructor can testify. We would therefore impress upon one and all to make it a rule, and to see that others abide by it also: NEVER REMOVE ANY PART OF A SMASHED AEROPLANE, HOWEVER SMALL AND APPARENTLY UNIMPORTANT. It is true that the fullest powers are already in hand by the authorities for dealing with any lapse in this direction, but it is only by implicit co-operation by the general public that this serious question can be effectively met.



American Flyers in France.

FROM the 11th inst. the entire personnel of the American Lafayette Air Squadron, fighting on the French front, reverted to its national uniform, and now fights under the American colours.

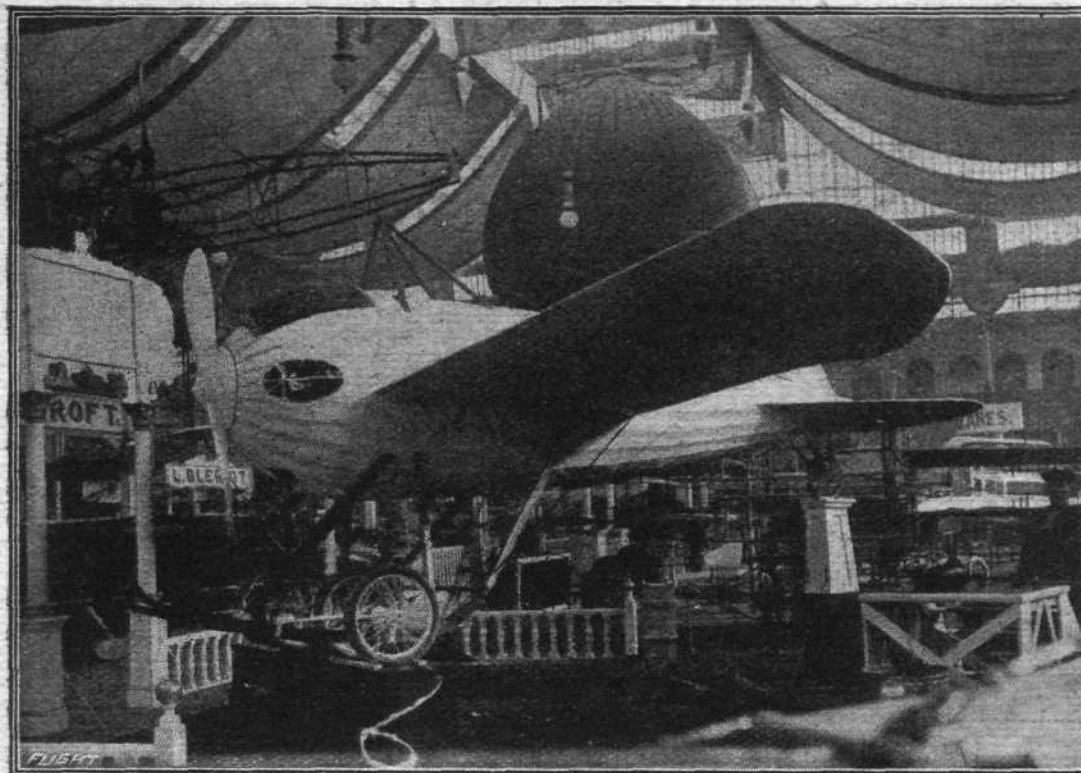
According to a report from Washington Mr. Baker, the

Secretary for War, has prepared a communication to be addressed to American aviators in the French air service, stating that the United States recognises the services which they are rendering, and desires them to remain at the front, as they are doing more important work there than it would be possible for them to do at home.

THE "TOTALLY ENCLOSED" AEROPLANE.

It is an old saying that history repeats itself, and there is more than a modicum of truth in the statement beloved by teachers of history, when they are endeavouring to make a young student realise that there is some utility in the irksome study of what appears to him a futile subject, that

part of his career Mr. A. V. Roe built and flew a successful triplane. With the crossing of the Channel by Mons. L. Blériot the monoplane type of aeroplane received an impetus which for a considerable time led to the belief that, at any rate for speed machines, the monoplane was the best solu-

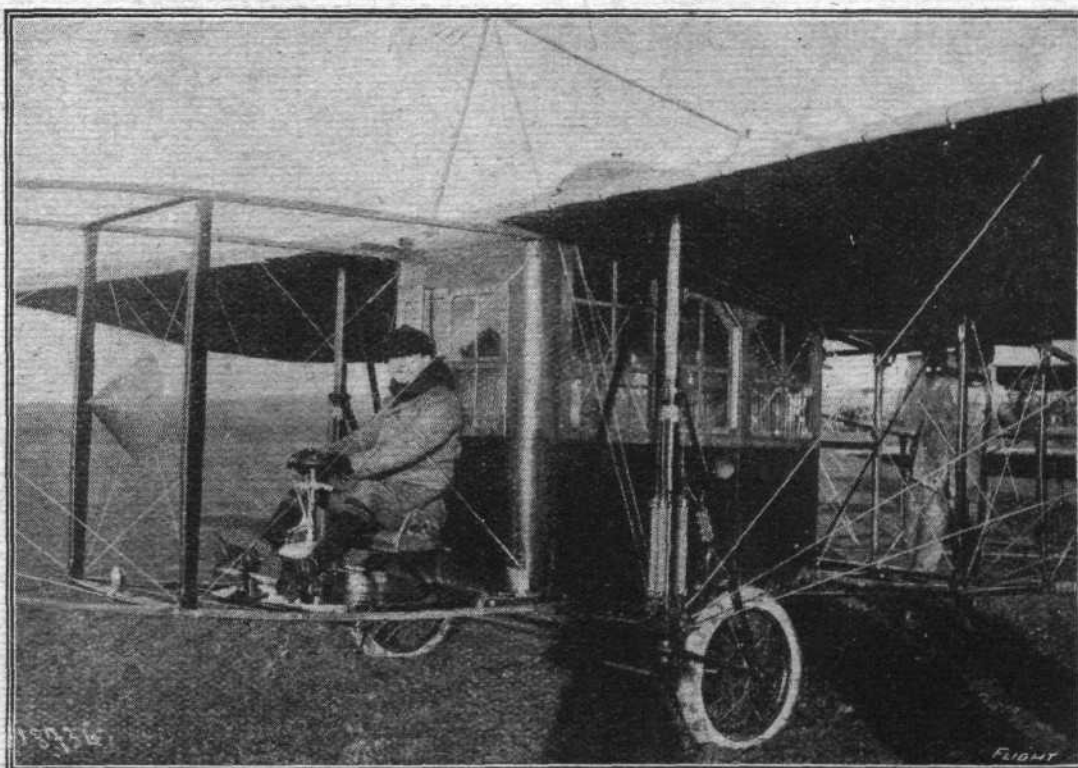


The Piggot monoplane exhibited at the Olympia Aero Show of 1911.

without a knowledge of the past it is impossible to form a correct appreciation of the present. Also it is often possible, by looking back and taking heed of the lessons of the past, to anticipate the happenings of the future. It might be reasonably supposed that aviation—one of the latest sciences—is yet too young to furnish proof of the old truth. Yet, on looking back one finds that as far away as 1842

this opinion was pretty general until Sopwith demonstrated the possibility of obtaining high speeds with a small biplane, the type that is now generally known as the scout. Again, although little was done with triplanes during the years following Roe's experiments, there is every indication that the triplane has not reached anything resembling its full development, and is, in fact, forging to the fore again.

The "Aerocar" built by Blériot in 1911 for Mons. Deutsch de la Meurthe.



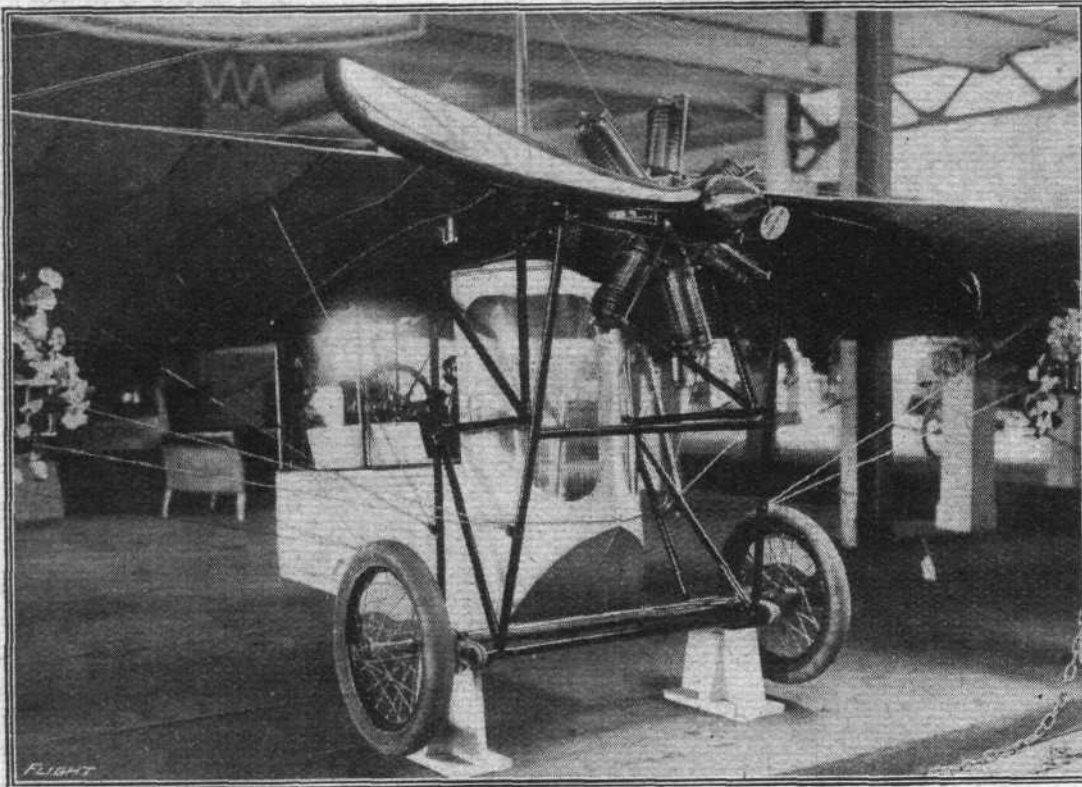
Henson suggested a design which incorporated all the essential features of the modern aeroplane, such as front and rear spars, main and secondary ribs, tail and body. In 1868 Stringfellow produced a triplane model, and during the earlier

One might easily find other examples of features suggested or even actually tried in the early days, which have gone out of fashion, so to speak, for a time, but which are showing signs of being revived in the latest models. Take the idea

of enclosing pilot and passengers inside the body to shield them from the elements. This was one of the features of Henson's design, but when aviation began to become a practical proposition as far as the mechanical side was con-

designed for comfort primarily, and speed will become a secondary consideration.

Apart from such early designs as the Henson already referred to, one of the first, if not, indeed, the very first,



The Bavarian Motor and Aircraft Works monoplane at the Berlin Show of 1912.

cerned, designers were so busy getting their machines to fly that naturally enough the comfort of the pilot was a minor consideration. Since, however, there would appear to be a tendency in modern design to shield the pilot and other occupants as much as possible, a feature that becomes more and more important as the speed of aeroplanes increases, a brief review of what has been done up till now in the way of totally enclosed machines may not be without interest.

full size machines in which the pilot and passenger were totally enclosed in the fuselage covering, was the Piggot monoplane exhibited at the Olympia aero show in 1911. This machine, as our illustration shows, had a stream-line body, even to a casing round the propeller boss, and it is, in point of fact, a debatable point whether the designer was primarily concerned with providing comfort for the passengers or obtaining maximum efficiency by stream-lining

The Rumpler Taube with enclosed body shown at the Berlin Exhibition of 1912.



There can be little doubt that after the war, when the last ounce of efficiency does not have to be provided at the sacrifice of nearly all other qualities, the aeroplane to be used for commercial and pleasure purposes will have to be

everything to the greatest possible extent. Be that as it may, the occupants were enclosed in the stream-line body, which they entered through circular openings in the floor. Presumably these same openings served to give a view in a

downward direction. An additional opening was provided under the engine near the nose, and windows on each side of the engine were to give the passenger a view directly forward. It is quite evident, in view of modern knowledge, that the pilot's range of vision was totally inadequate, and as a matter of fact, when the machine was ultimately tried, an opening was cut in the top of the body, through which the pilot's head projected. The machine was not a very great success, but we should hesitate to put this down to the fact that it was totally enclosed. Rather is it to be assumed that the chief trouble was insufficient power.

During the summer of 1911 another enclosed machine was being constructed, this time at the works of Mons. Blériot. It was built to the order of that distinguished patron of aviation, Mons. Deutsch de la Meurthe, and had a cabin body with seating accommodation for four passengers. The cabin was most elaborately equipped, and was provided with mica windows through which the occupants were to get a good view of the country over which the machine was flying. The pilot was seated out in the open in front of the cabin, and to facilitate communication between passengers and pilot a speaking-tube similar to those used on motor cars was fitted. This machine had a fixed tail plane, but no rear elevator, longitudinal balance being maintained by the use of an elevator mounted on outriggers a short distance in front of the cabin. The power plant was a 14-cylinder 100 h.p. Gnome motor mounted level with the trailing edge of the wings, and above the roof of the cabin. Ready for flight, but without the passengers, the machine weighed about 1,500 lb., so that with the full complement of passengers the weight must have been in the neighbourhood of 2,300 lb., a by no means small load to be carried by a single pair of wings. During its trial flights this machine flew quite well with pilot alone, but it is doubtful whether it was ever really successful with a full load of passengers. The flat front of the cabin presented some 20 odd sq. ft. of surface normal to the wind, and if the speed be assumed to be about 50 m.p.h. this surface alone would absorb something like 30 h.p.

The following year—1912—witnessed the production of quite a number of enclosed aeroplanes, inspired probably by the exhibition at the Paris Salon of the Blériot "Aerocar" during the previous year. In Germany two examples were on view at the Berlin exhibition held in April of that year.

One of these was exhibited by the well-known Rumpler firm. This machine was, practically speaking, a standard Taube type monoplane, in which the turtle deck had been increased in depth until it covered the occupants. As our illustration shows, this turtle back or roof only extended to a point a short distance behind the pilot's. Two mica windows in each side provided a view in an outward and upward direction, while a diminutive window, making an angle of about 45° with the line of flight, was fitted in a small dash near the rear of the engine. This can be seen in the photograph just ahead of the leading edge of the wing where it joins the body. The forward view obtainable through this latter window was admittedly of a very restricted character, especially as the pilot occupied the rear seat. Whether or not this machine met with any great success cannot be stated, but certainly it was not produced in quantities.

Another monoplane with enclosed cabin at the same exhibition was one built by the Bavarian Motor and Aircraft Works. As the illustration shows, this machine was of the underslung type, similar to the Blériot "Aerocar," but the engine—a 50 h.p. rotary built by the same firm—was mounted in front of the wings. The undercarriage was built up of steel tubes throughout, and the tail planes, which were mounted on tubular outriggers, were also made of steel. The cabin provided seating accommodation for two—side by side. Dual control was fitted so that either of the occupants might handle the machine. Windows in the side and front furnished an excellent view outwards as well as forward, where the engine was mounted so high as to not impede the view to any considerable extent. As a matter of fact, it would appear that the engine, or more correctly speaking the propeller, was placed somewhat too high for the centre of thrust to coincide with the centre of resistance, and possibly there would be a tendency for the tail to drop when the engine was switched off. The workmanship and finish of this machine were excellent, and apart from the points raised above its general lines were rather pleasing. We have, however, no information regarding its performance, and no more of the type were seen after the show. The span was 35 ft. and the overall length 25 ft. The total weight is stated to have been only 660 lb. empty, which appears somewhat optimistic in view of the amount of steel employed in the construction. (To be continued.)



THE FINISH OF A ZEPPELIN.—Unique photograph of the remains of Zeppelin "L. 39," which was recently brought down at Compiègne after, it will be remembered, having visited the south of England in company with other Zeppelins. This photograph is complementary to the one which we published in "FLIGHT" on March 22nd, in which the remains of the Zeppelin are shown, as seen from the ground, immediately after the fall of the wrecked airship.

ROYAL AERO CLUB OF THE U.K. OFFICIAL NOTICES TO MEMBERS.

HOUSE COMMITTEE.

A MEETING of the House Committee was held on Wednesday, the 11th inst., when there were present:—Mr. J. H. Nicholson, in the Chair, Capt. R. L. Charteris, R.F.C., Mr. C. G. Greenhill, Mr. Henry Knox, Mr. J. Stewart Mallam, Mr. J. H. Spottiswoode, and the Assistant Secretary.

Chairman.—On the motion of Mr. Mallam, seconded by Mr. Spottiswoode, Mr. J. H. Nicholson was appointed Chairman of the Committee.

House Accounts.—A Profit and Loss Account for the month of March was submitted by Mr. Mallam, which showed that the house finances were very satisfactory.

Bedrooms.—It was decided that for the present the price of bedrooms should be 5s. each per night.

Hours of Opening.—It was decided that the Club should be open each day from 8 a.m. to 12 midnight.

By-laws.—The revised Club By-Laws were approved for submission to the Committee.

Club House.

The following prices have been fixed for the present by the Committee:—

Bedroom (including Bath)	..	5s. each per night.
Breakfast	2s. 6d.
House Luncheon	2s. 6d.
House Dinner	3s. 6d.

Billiard Room.

It is hoped that the Billiard Room will be ready in the course of next week.

Flying Services Fund.

The Countess of Drogheda has very kindly handed to the Club for the Flying Services Fund a cheque for £400, being half of the profits of the Aircraft Exhibition held at the Grosvenor Galleries.

Sir Robert Borden's Tribute to the Flying Services.

SPEAKING at Edinburgh on April 11th, when he was presented with the freedom of the city, Sir Robert L. Borden, Prime Minister of Canada, said:—

"In no part of the vast and complex organisation requisite for modern warfare was there greater need for foresight, unceasing effort, mechanical genius, and industrial achievement of the highest order than in the organisation and equipment of the air service. Canadians have joined that service in large numbers, and I am proud to know that they have been found daring, resourceful and efficient. Any criticism of its organisation and management arouses, therefore, my deepest interest. In the Imperial War Cabinet we have recently had a full statement of conditions in the flying service as they were a year ago and as they are to-day. The information thus afforded was very reassuring. The greater extent of the work carried out by our air service, as compared with that of the enemy, the higher artillery efficiency thus attained, the resulting diminution of our casualties in the trenches, and the increased loss inflicted upon the Germans through information obtained by air observation and reconnaissance—all these considerations must be taken into account. Given a machine of equal efficiency our men may be relied on to do their full part.

"There never has been any question that in personnel our Flying Service is superior to that of the enemy and stands second to none. The position disclosed to the Imperial War Cabinet may be briefly stated as follows: The machines which we are turning out to-day are equal if not superior to any that the Germans have hitherto produced, and they are being produced at a rapidly increasing rate, the details of which it would be unwise to give. The average efficiency of our machines now in use is equal to the average of the German machines. The average of casualties on the machine which has been most severely criticised is less than the general average on all our machines. But a most important fact to realise and to remember is this—the British Air Service is undertaking extensive duties of vital importance to operations in the field, duties which are not being carried on and never have been attempted—at least to anything like the same extent—by the German air service. A more extensive service in the air thus carried on for essential purposes must inevitably be attended with increased losses; and the real question is as to the value of the information thus obtained when compared with the loss sustained in acquiring it. On this question the military authorities entertain no doubt.

"The casualties among officers are necessarily great because the proportion of officers in the Air Service is very much larger than in the other services. I take leave to put forward these considerations because unfounded rumour or

Library.

Mr. Claude Grahame-White has presented to the Club a copy of his new book entitled "Air Power."

Flying Services Fund.

Boxes for collecting subscriptions for the Flying Services Fund are now available, and anyone wishing to have a box can obtain the same on application to the Secretary.

THE FLYING SERVICES FUND administered by

THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 3, Clifford Street, New Bond Street, London, W. 1.

Subscriptions.

	£	s.	d.
Total subscriptions received to April 10th, 1917	11,232	9	9
Countess of Drogheda: Half of the profits of the Aircraft Exhibition held at the Grosvenor Galleries	400	0	0
Royal Naval Air Station, Dunkirk: Profit realised by sale of Christmas Cards	97	9	0

Total, April 18th, 1917 11,729 9 9

B. STEVENSON, Assistant Secretary.

3, Clifford Street, New Bond Street, W.

criticism, tending to discourage the spirit of British airmen, is detrimental and should not be continued. If doubt arises as to the facts, it would be well, through an informal gathering of members or by means of a secret Session, to disclose to Parliament the information already afforded to the Imperial War Cabinet."

General Smuts' View.

ON the same occasion, as the above, General Smuts, who was also given the freedom of Edinburgh, speaking of his recent visit to the Western front, said:—

"During the days I was at the front we were making enormous preparations for the attack, accumulating men and material, yet I did not see a single enemy aeroplane watching what we were doing. Why not? Because our own airmen were fighting there, 10, 15 and 20 miles behind their fronts. No doubt our casualties in the air were heavy, but you do not count casualties when you are fighting victoriously. I am sorry sometimes when I see all the carping criticisms. Remember that our airmen are not grown men, but boys taken fresh from school, and when these brave souls see that their branch of the Service is a continual subject of attack it does take the heart out of them. There was no part of the Services of which they might be more proud."

Sir D. Henderson on the Air Services.

OPENING Lady Drogheda's exhibition at Birmingham on April 12th, Lieut.-General Sir David Henderson, D.S.O., Director-General of Military Aeronautics, said:—

"They had all heard during the last two-and-a-half years that the Royal Flying Corps and the Royal Naval Air Service were at the point of death, that everything was wrong, that the Germans were ahead of us, that we could not stop Zeppelins, and that we could not do our work at the front. It was only reasonable to suppose that after all this talk they might think there was something in it, but he would advise them not to believe it. So far as his corps were concerned, every time there had been anything going on at the front, from the first battle at Ypres down to the last one on the Somme, when the bell rang they had been there. Of course, it was not possible to keep it up all the time. A good many things interfered with keeping what people were foolish enough to call command of the air, which had never existed—neither command nor mastery. All we could hope was to be a little superior at the right time, and if they asked people who had been out they would find that on those occasions we had not been troubled very much by German aeroplanes. He did not want to prophesy, but they would find there was another important time going on just now, and he should advise them to see if the same thing did not happen again."

THE ROLL OF HONOUR.

REPORTED by the Admiralty:—

Killed.

Lieut. S. G. Hill, R.N.V.R.
Acting Sqdn.-Comdr. J. J. Petre, D.S.C., R.N.
Flight Sub-Lieut. A. L. Thorpe, R.N.

Seriously Injured.

Prob. Flight Sub-Lieut. J. A. Morell, R.N.

Missing.

Flight Sub-Lieut. N. D. M. Hewitt, R.N.
Acting Flight-Comdr. R. G. Mack, R.N.
Flight Sub-Lieut. L. M. B. Weil, R.N.
217874 Leading Mech. W. E. Jones, R.N.A.S.

Previously believed to be Prisoner of War, now reported Wounded and Prisoner of War in Bulgaria.

Flight Sub-Lieut. S. G. Beare, R.N.

Reported by the War Office:—

Killed.

Lieut. H. G. Collins, R.F.C.
Lieut. H. H. Evans, Can. Mtd. Rif., attd. R.F.C.
Capt. G. J. Jones, R.F.C.
2nd Lieut. W. Moyes, R. Scots and R.F.C.
1224 Sergt. W. E. Bastable, R.F.C.
8369 1st Air Mech. A. W. Evans, R.F.C.

Previously reported Missing, now reported Killed.

2nd Lieut. L. L. Clark, R.H.A. and R.F.C.
2nd Lieut. N. A. Phillips, R.F.C.

Died of Wounds.

Lieut. H. A. R. Boustead, Middlesx. and R.F.C.
2nd Lieut. A. Emmerson, Leicester and R.F.C.
2nd Lieut. A. C. Finlayson, R.F.C.
Major W. A. Grattan-Bellew, M.C. Con. Rangers and R.F.C.
Lieut. A. J. Hamar, R.F.C.
2nd Lieut. H. N. Hampson, S. Lancs. and R.F.C.
2nd Lieut. K. C. Horner, W. Yorks and R.F.C.
2nd Lieut. E. Kent, Essex, attd. R.F.C.
2nd Lieut. J. A. Myburgh, R.F.C.

Previously reported Wounded, now reported

Died of Wounds.

2nd Lieut. A. D. Collins, R.F.C.

Accidentally Killed.

1129 Sergt. S. Brooks, R.F.C.

Died as Prisoner of War in Turkish hands.

862 Corpl. A. Reid, R.F.C.

Wounded.

2nd Lieut. A. B. Anstey, R.F.C.
Lieut. W. Baillie, R.F.C.
2nd Lieut. R. H. Barratt, Middlesx., attd. R.F.C.
2nd Lieut. G. E. Brookes, R.F.C.
2nd Lieut. J. S. Dowland, Yeo. and R.F.C.
2nd Lieut. W. H. Farrow, R.F.C.
2nd Lieut. W. W. Glinn, R.F.A. attd. R.F.C.
2nd Lieut. P. L. Hogan, King's (L'pool R.), attd. R.F.C.
Lieut. E. L. Hyde, R.F.C.
2nd Lieut. R. H. Latham, R.F.C.
2nd Lieut. J. Lawson, R.F.C.
Lieut. R. Mack Grant, Can. Gen. List, attd. R.F.C.
Lieut. R. A. Manby, R.F.C.
Lieut. O. D. Norwood, R.F.C.
2nd Lieut. H. C. W. Strickland, E. Surrey, attd. R.F.C.
2nd Lieut. C. T. Travers, Wilts., attd. R.F.C.
2nd Lieut. D. P. Walter, R.F.C.
Major A. C. Wright, R.F.C.
61852 2nd Air Mech. W. H. Richman, R.F.C.

Wounded and Missing.

2nd Lieut. E. P. Hyde, Cheshire and R.F.C.

Missing.

Lieut. A. T. Adams, Wilts., attd. R.F.C.
Lieut. C. F. Bailey, London and R.F.C.
2nd Lieut. E. V. A. Bell, Hants, attd. R.F.C.
2nd Lieut. O. W. Berry, K.O.S.B., attd. R.F.C.
Lieut. R. J. Bevington, R.F.A., attd. R.F.C.
2nd Lieut. D. C. Birch, Northants, attd. R.F.C.

Lieut. N. A. Birks, R.F.C.
Lieut. H. D. Blackburn, R. Berks., attd. R.F.C.
2nd Lieut. J. E. Blake, R.E., attd. R.F.C.
2nd Lieut. A. Boldison, Lincolns., attd. R.F.C.
Lieut. J. K. Bousfield, M.C., R.E., attd. R.F.C.
Lieut. E. T. C. Brandon, R.F.C.
2nd Lieut. A. R. Brown, R.F.A., attd. R.F.C.
Lieut. T. F. Burrill, Yeomanry and R.F.C.
2nd Lieut. L. Butler, K.O. (Yorks. L.I.), and R.F.C.
2nd Lieut. C. St. G. Campbell, R.F.C.
2nd Lieut. H. B. Cooksey, R.W. Kent, attd. R.F.C.
Lieut. H. A. Cooper, London and R.F.C.
2nd Lieut. S. Cooper, R.F.C.
2nd Lieut. N. C. Denison, K.O. (Yorks. L.I.) and R.F.C.
2nd Lieut. R. W. M. Davies, N'land. Fus., attd. R.F.C.
Lieut. W. L. Day, R.F.C.
Lieut. L. Dodson, R.F.C.
Capt. D. W. Edwards, M.C., A.S.C., attd. R.F.C.
Lieut. L. Elsey, Can. Gen. List, attd. R.F.C.
Lieut. B. Evans, R.F.C.
2nd Lieut. G. Everingham, R.F.C.
Lieut. H. D. K. George, R. Dublin Cus., attd. R.F.C.
2nd Lieut. C. S. Hall, R.F.C.
2nd Lieut. H. D. Hamilton, R.F.C.
Lieut. G. J. Hatch, London and R.F.C.
2nd Lieut. J. F. Heagerty, Bufts (E. Kent), attd. R.F.C.
Lieut. F. R. Henry, Canadian General List, attd. R.F.C.
2nd Lieut. H. E. Hervey, M.C., R.F.C.
Lieut. E. L. Heyworth, R.F.C.
2nd Lieut. F. Higginbottom, Cheshire, attd. R.F.C.
Lieut. R. Hume, R. Fus., attd. R.F.C.
Capt. A. Jennings, R.F.A., attd. R.F.C.
Lieut. O. R. Knight, Queen's (R. West Surrey) and R.F.C.
Capt. M. B. Knowles, London and R.F.C.
2nd Lieut. A. N. Lecker, R.F.C.
2nd Lieut. M. Lewis, R.F.C.
Lieut. H. Loveland, Can. Inf., attd. R.F.C.
2nd Lieut. A. H. Margoliouth, K.O. (Yorks. L.I.) and R.F.C.
2nd Lieut. J. A. Marshall, Cyclist Batt. and R.F.C.
Lieut. A. H. K. McCallum, Canadian General List, attd. R.F.C.
2nd Lieut. D. P. McDonald, Cam. Hdrs. and R.F.C.
Maj. J. A. Milot, Canadian General List, attd. R.F.C.
2nd Lieut. V. C. Morris, Army Cyclist Corps, attd. R.F.C.
2nd Lieut. J. I. M. O'Beirne, R. Warwick, attd. R.F.C.
2nd Lieut. H. S. Pell, R.F.C.
2nd Lieut. A. C. Pepper, R.F.C.
2nd Lieut. J. R. S. Proud, R.F.C.
2nd Lieut. H. S. Richards, Sher. For., attd. R.F.C.
2nd Lieut. A. R. M. Rickards, R.F.C.
Capt. W. L. Robinson, V.C., Worcesters., attd. R.F.C.
2nd Lieut. J. K. Ross, R.F.C.
2nd Lieut. P. A. Russell, Cam. Hrs. and R.F.C.
2nd Lieut. J. H. Sayer, R.F.C.
2nd Lieut. U. H. Sequin, R.F.C.
2nd Lieut. S. A. Sharpe, R.F.A., attd. R.F.C.
2nd Lieut. G. O. Smart, R.F.C.
2nd Lieut. R. Smith, K.O. (Yorkshire L.I.), attd. R.F.C.
2nd Lieut. E. B. Smyth, R.F.C.
Lieut. D. J. Stewart, York and Lanc., attd. R.F.C.
2nd Lieut. W. T. B. Tasker, R.F.C.
2nd Lieut. C. P. Thornton, King's (L'pool.), attd. R.F.C.
Lieut. E. J. D. Townsend, R.F.A., attd. R.F.C.
2nd Lieut. F. G. Truscott, M.C., Suffolk and R.F.C.
2nd Lieut. E. D. Warburton, R.F.C.
2nd Lieut. A. P. Warren, R.F.C.
Lieut. J. H. B. Wedderspoon, R.F.A., and R.F.C.
Lieut. V. J. Whitaker, Lincoln., attd. R.F.C.
2nd Lieut. J. C. D. Wordsworth, Durham L.I. and R.F.C.

Previously reported Missing, now reported

Prisoner of War in German hands.

Lieut. C. H. March, R.F.A., attd. R.F.C.

Previously reported Missing, believed Prisoner of War, now reported Prisoner of War in Bulgarian hands.

Lieut. J. C. F. Owen, Canadian A.S.C., attd. R.F.C.

Correction:

Killed.

2nd Lieut. J. S. Cooper, R.F.C., should read—Lieut. Cooper.

The "Reprisal" Air Raid.

THE following was issued by the Admiralty on Monday:—
"In consequence of the attacks made by German submarines on British hospital ships in direct and flagrant contravention of Hague Convention No. 10, a large squadron,

composed of British and French aeroplanes, carried out a reprisal bombardment of the town of Freiburg on Saturday. Many bombs were dropped with good results. In spite of a large number of air fights with hostile aeroplanes all machines returned safely with the exception of three."

IDENTIFICATION OF GERMAN AEROPLANES.

(COPYRIGHT.)

It would appear from the number of letters we have received during the last few weeks, from both officers and men of various units of the British forces in France, asking us to publish diagrams of the latest German machines, that considerable difficulty is still experienced in identifying the various makes and types. When it is remembered that the two-seater tractors being used by the enemy are really surprisingly alike it will be realised that it must, indeed, be a perplexing task to identify them when they are cruising about at anything above 12,000 ft., even if the best of field glasses are taken into service. Once the particular type of machine has been identified, its speed will, in most cases, be known to our gunners and pilots, and the question of getting the range will thus be, at any rate to some small extent, simplified.

With regard to the identification of aeroplanes—quite apart, of course, from the question of nationality, which is indicated by the various distinction marks—it has been our experience, gained during eight years of watching machines in the air, that the only way of learning to do this with any degree of certainty is to observe at every opportunity the evolution of the machine in the air, seeing it in every conceivable attitude and from all sorts of different points of view. For instance, two machines may look exactly alike from one point of view, but as soon as one of them makes a turn so as to present itself to the observer in a different aspect he will no longer be in doubt as to which is which. In teaching, therefore, anyone how to identify a certain aeroplane by means of pictures it can, it appears to us, only be done by showing them the machines from a variety of points of view. When one desires in this manner to illustrate more than one machine there are two possible courses open. One consists in showing the same machine in different attitudes so as to make the observer familiar with every aspect of it; the other alternative is to illustrate the various machines all in one attitude in order to facilitate comparison between the different types. Of these two methods we have decided on the latter for a start, which forms the basis of the illustrations of German aeroplanes that we propose to publish in the present and subsequent issues of "FLIGHT."

The accompanying sketches of German aeroplanes have been plotted by a special method devised by the staff of "FLIGHT," and are chiefly characteristic and, it is hoped, useful, in two respects. In the first place all the machines are shown in one position, and any difference in shape or peculiarity of any structural member is at once apparent by comparing the machines. Secondly, the machines are drawn as near as possible to a uniform scale—in a perspective drawing it is scarcely possible to do so absolutely—so that the relative sizes one to another of the various machines are clearly indicated. In later issues of "FLIGHT" we propose to publish other views of the same aeroplanes, upon exactly the same principles, in order to familiarise our readers with their appearance from different points of view.

Taking first the two small biplanes—the Albatros chaser (Bü) and the Halberstadt—it will be noticed that these two do not differ very greatly as regards their dimensions, which, together with the dimensions of the other machines, are given at the end of this article. In detail, however, each has its characteristic features. For instance, the Halberstadt has two

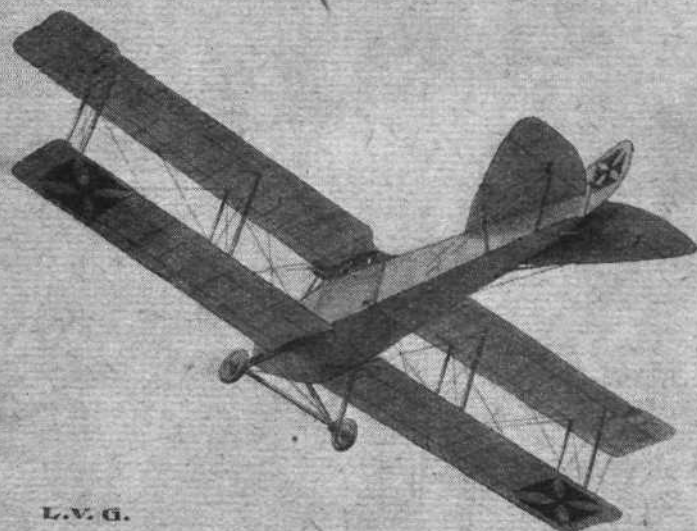
pairs of struts on each side, whereas the Albatros Bü follows British practice in that only one pair of inter-plane struts separate the wings on each side. This difference will, however, scarcely be noticeable at any great distance, and so does not form a very good means of identification. A peculiarity more likely to prove useful is that in the Halberstadt the planes are comparatively close together and heavily staggered, whereas in the Albatros Bü the gap is greater and the planes far less staggered. The result of this wing spacing is to give the Halberstadt a decidedly "squatty" appearance. This has been confirmed by pilots who have seen this machine at close quarters during aerial fights. The bodies of the two machines, if a sufficiently close view of them can be obtained, are also quite distinct, that of the Albatros Bü being made of 3-ply wood and of elliptical section, while that of the Halberstadt resembles the body of a Morane. At a great distance the part that will probably form the most easily recognised distinguishing feature is the tail. Whereas that of the Halberstadt consists of a small divided elevator, the Albatros has a large fixed tail plane, to which is hinged an elevator running right across from side to side.

As the tail, in the particular view shown this week, forms one of the best means of identification, the remaining four machines may be divided into two main groups, according to the shape of the fixed tail plane. The one group has a triangular, or nearly triangular, tail plane, whereas the tail of the other is approximately of semi-circular plan form. In the Rumpler biplane the fixed tail plane is absolutely triangular, with straight sides. In the L.V.G. only the trailing edge of the tail is straight, the two sides being slightly curved. This curve, however, is so slight that at a distance it would probably not be noticeable. The Albatros C.III and the Aviatik both have semi-circular tail planes, but that of the former is mounted approximately half-way down the sides of the body and in the latter rests on top of the body. Also the body of the Albatros tapers to a horizontal knife-edge at the back, whilst the Aviatik terminates in a vertical stern post.

Individual parts such as *aileron*s can only serve as guides when a fairly close-up view can be obtained, when they may be useful. It will be noticed that in the Aviatik and L.V.G. the *aileron*s are straight in plan form, while in the Albatros C. III and Rumpler they are wider at the tip than at the root. Those of the L.V.G. are further peculiar in that they are stepped, that is to say the outer half is at a smaller angle of incidence than is the inner half. The space between the two portions is covered with fabric. In the Aviatik the lower wing, it will be noticed, has its trailing edge sloping forward for the last few feet from the tip.

The following table gives the approximate dimensions of the various machines:—

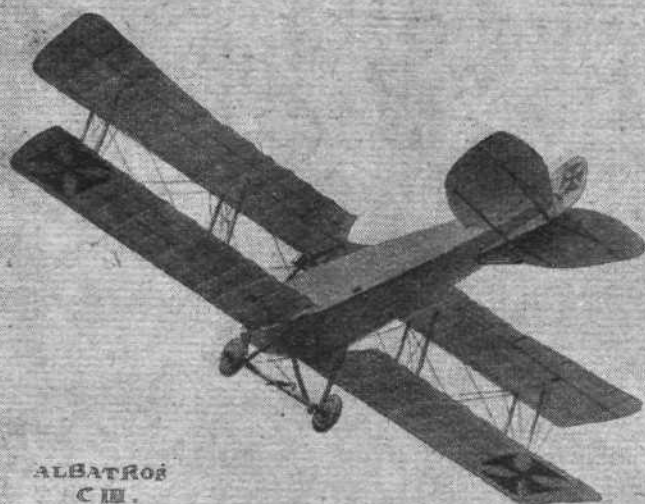
Name of Machine.	Span.				Length.	
	Top.	Bot.	Gap.	Chord.	O.A.	
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	
Albatros C. III	39 2	37 3	5 3	6 1	26 4	
Albatros Bü.	28 4	26 9	5 3	5 9	24 0	
Aviatik	41 0	35 4	6 4	6 1	26 3	
Halberstadt	28 6	26 0	4 6	5 0	24 0	
L.V.G.	42 10	37 10	6 3	5 10	27 0	
Rumpler	40 3	36 1	5 9	5 5	25 10	



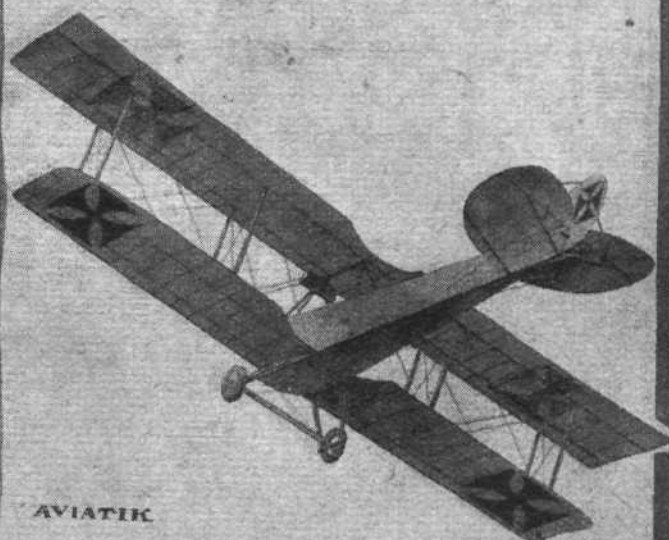
L.V.G.



HALBERSTADT



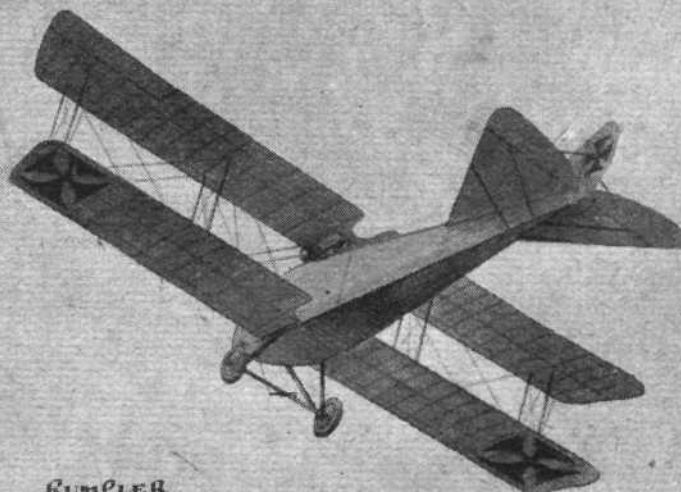
ALBATROS
C III.



AVIATIK



ALBATROS
B U



RUMPLER

NOTES FROM PARIS.

By DOUGLAS W. THORBURN.

Travelling.—No one thinks of travelling for pleasure in these strenuous times, which is fortunate, for there is little pleasure to be found that way, especially in a journey, for example, from London to Paris and back—and more especially in the wintry spring weather which has marked the coming of our official "summer time." To begin with, there is much to be done before one obtains a passport and a military permit to use it. I was able to show that I was going to Paris on important business not unconnected with the war, and probably my application was made the easier by reason of the fact that my business was on behalf of the ex-Lord Mayor of London, while the present Lord Mayor was good enough to endorse it. What further guarantee of good behaviour, apart from an honest face, could even the Foreign Office desire? The journey by way of Southampton and Havre is tedious, to put it mildly. Many hours are spent in cold and uncomfortable sheds watching other people having their luggage and passports examined. Many more hours are wasted at Havre because the steamer lands you there early in the morning, and the train leaves for Paris at 5 o'clock in the evening. However, "*c'est la guerre*." I know one distinguished Anglo-French gentleman in aviation circles who gets to Paris in much shorter time, but he has the inestimable advantage of a Rolls-Royce, a diplomatic passport available via Folkestone and Boulogne, and a winning smile. The next time I go across I should like to hire a Handley-Page. The Customs officers could amuse themselves by walking about and inspecting my luggage *en route*. I am more than ever convinced that aerial travelling will be the mode of the future.

Life in Paris.—The beauty and charm of Paris are beyond question, even in war time. Its countless endless avenues, its broad boulevards, its spacious Place de la Concorde, are all without equal. Its shops are as artistic as ever, and its cafés and restaurants still busy and amusing, but there is no doubt the war has been felt more there than in London. The serious shortage of coal has affected life in many directions. Restaurants close at 9.30, but there are no restrictions on the sale of intoxicants, with the exception of absinthe, up to that hour. On two days a week afternoon tea is prohibited, and one cannot buy cakes or confectionery of any kind. French is the only language permitted on the telephone, and I had to produce my passport before I could send a telegram to London. The recent great successes of the Allied forces have put new life into Paris, and with the advent of spring and the opening of the theatres nightly, after being closed four nights a week during the winter months, the city is regaining some of its old gaiety.

Guynemer.—I have been staying for three weeks at the same hotel as the famous Captain Guynemer, whose brilliant record in the French flying services is well known all over the world—and perhaps best of all in Germany. On the day on which I first met him he had brought down his 36th enemy machine, and on the previous day he had accounted for three others. His bedroom is littered with souvenirs of his various victims. One morning he showed me a machine gun from a Boche aeroplane which he had hit fairly in the loading mechanism—a fine shot. He had also secured from another recent victim a German compass and sundry charts, soaked in blood—a gruesome trophy. In reply to my comment that he seemed to have made a mess of some one, he said, "No, that was Lieut. S———. I only shot him through the leg. He is a prisoner, and a very nice fellow indeed. I go to visit him occasionally . . . But it is Boche blood!" Guynemer has a striking personality. He is young—22, I

believe—slender and very upright, with a pale face and dark expressive eyes not easy to forget. I learned from him one interesting fact which does not appear to be generally known, namely, that through his mother he is directly descended from Sir Walter Scott. He is a born pilot and a magnificent shot, and looks like winning more decorations yet, though I don't know how he will find room to wear them all. Like the other members of the famous "Storks" squadron to which he is attached, he has a sort of roving commission over the lines with his Hispano-Suiza Spad, and it is told how, on one recent occasion, he was at the end of his ammunition when he saw another enemy machine somewhere underneath him, and decided to try and capture it. Diving towards it, he commenced to circle around in order to let the pilot observe the well-known distinguishing mark which all "Storks" bear on their planes. The Hun evidently saw it and made a forced landing, and Guynemer landed beside him and made him a prisoner. The remarks of the Hun on finding he had been caught by an aviator whose only effective weapon happened to be a revolver are said to have been quite unprintable! Guynemer is one of the greatest pilots France has produced, and it is gratifying to be able to claim him as at any rate partly Scotch!

Old Friends.—I got quite accustomed to meeting Guynemer about the city on his Sigma, a small two-seater car of Paris manufacture, with a sporting body enamelled white, but one day while motoring some miles outside the fortifications I had an unexpected encounter on the road. A big car was going—not too slowly—in the opposite direction, and I caught a fleeting glimpse of our old friend Pierre Verrier at the wheel. We both pulled up and came back for a chat, and his numerous friends at Hendon and elsewhere will be glad to hear that he was looking quite his old self again, and showing no traces of the serious accident which befel him some time ago. Another friend who will be well known to many Hendon pupils was Mr. Frank Delves, who was at one time learning under Mr. Clifford Prodger at the Beatty School, and is now manager in France for the Sperry Gyroscope Co. Of this gentleman and his firm I hope to be allowed to write at greater length next week.

The Limit.—While I think of it, I should like to make a note of one incident which occurred when Delves and I were talking together one evening at a certain famous resort which I will not indicate more particularly than to say it might be regarded as the unofficial headquarters of the American Flying Squadron in Paris. The room was fairly full, and Delves was showing me a document of a somewhat confidential nature dealing with aviation. While we were reading it I found a youth in the uniform of an officer in a French colonial force was calmly looking over our shoulders also reading it. At once I asked Delves if this was a friend of his, and he turned round and asked what the Dickens—or words to that effect—the youth meant by his behaviour. He replied in the coolest possible fashion, "Oh, it interests me very much!" I must confess that for some minutes we were so astonished we could think of no suitable retort.

English Self-Taught.—I met one morning a Brazilian friend who speaks French well, and English not quite so well, though well enough, and mentioned the fact that I had just seen an artificial leg factory on fire. (One is always seeing something new in Paris.) Fortunately it was soon over and the damage was slight. My friend, on learning that I was on the spot when the outbreak occurred, said:—"That was very interesting. And did you wait until the—how do you call it in English?—the Salvation Army arrived—" . . . I had to explain I could not have spared the time.

"Air-Power."

In this book, the latest work in collaboration of Messrs. Claude Grahame-White and Harry Harper, the object has been to enforce the lesson that "in the future a nation which dominates the aerial highways will dominate also those of the land and sea; that a dominion of the air must mean, ultimately, the dominion of the world." Written so as to be understood by the general reader who may be unacquainted with the technicalities of aviation, the book first deals with the use of aeroplanes in war, after which "Problems in Construction"; "Our Policy After the War"; and "Factors of Safety" take their turn. In "Popularising Travel by Air" some hints are given as to the use of aeroplanes on a commercial scale for cross-country travelling, and this is further enlarged upon in the section headed "The Commercial Era of Flight," in which the authors wax prophetic, and consider

the possibility of flying from New York to London and back again in 48 hours, with a first-class fare each way of £300. The book, which is illustrated by a number of photographs depicting the construction of a modern type aeroplane in the Grahame-White works, is published by Messrs. Chapman and Hall at 7s. 6d. net.

The Arrest of Sub-Lieutenant Navarre.

SOME excitement was caused in Paris recently by Sub-Lieut. Navarre, who drove a large motor car through the streets, knocking over half-a-dozen policemen, several lamp-posts, and doing other damage. He was arrested on Monday and charged with attempted manslaughter. It is explained that since he was severely wounded in an aerial fight in June last, he has shown symptoms of an unbalanced mind, and this is to form the subject of an enquiry.

ANSWERS TO CORRESPONDENTS

Notice to Correspondents in General.

Applications for commissions in the Royal Naval Air Service should be addressed to the Director of Air Services, Admiralty, S.W. The necessary form and conditions of entry can be obtained from the Secretary of the Admiralty.

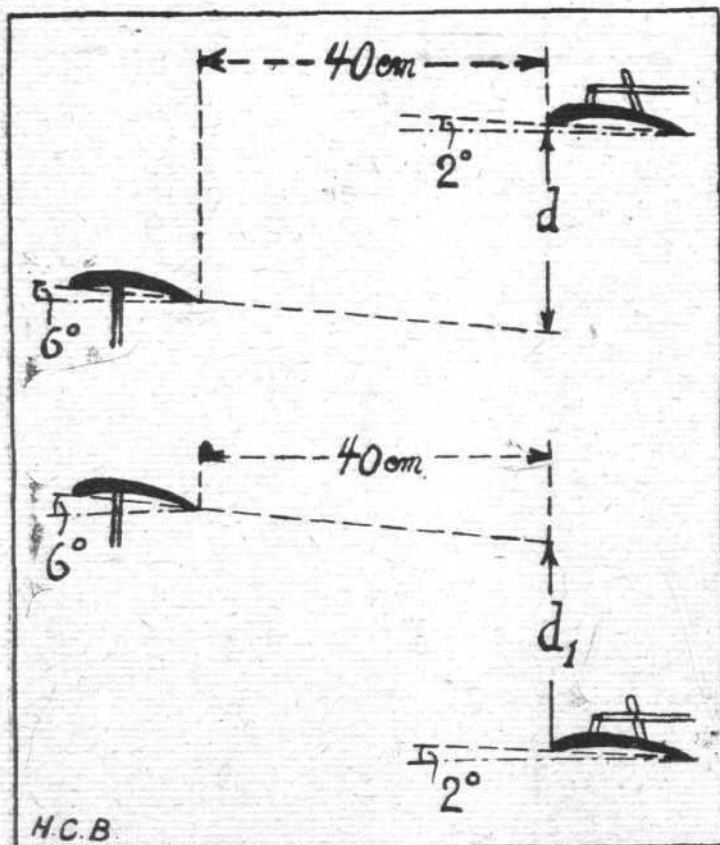
Applications for commissions in the Royal Flying Corps should be sent to the Director-General of Military Aeronautics, Hotel Cecil, Strand, W.C.

Those who wish to enlist in the R.N.A.S. should apply to the nearest naval recruiting station or to the R.N.A.S. Drafting Office, Crystal Palace, S.E. Skilled mechanics are taken whatever their army classification, but unskilled men are only taken if they are classified B1, B2, or C1.

For enlistment in the R.F.C. apply to Major Mitchell, the Polytechnic, Regent Street, W. Men who are classed B1 or B2 are wanted as armourers, acetylene welders, carpenters, coppersmiths, motor transport drivers, electricians, engineer fitters, watchmakers, instrument repairers, wireless telegraphy, cabinet makers as riggers, tailors as sail-makers, vulcanisers, petrol winch drivers, fitters. Unskilled B1 and B2 men are also wanted for the balloon party and labour section and C2 or C3 men who are tailors and shoe-makers. Motor cyclists if with good eyesight are also accepted.

H. C. B. (2nd A.-M.)

The nearest approach to the figures you require is provided by a set of experiments carried out by Mons. G. Eiffel



at his laboratory at Auteuil. In these experiments two surfaces were placed behind one another, the front one

measuring 90 x 15 cm. and having an angle of incidence of 6°, the rear one measuring 45 x 15 cm. and having an angle of incidence of 2°. The distance between the trailing edge of the front plane and the leading edge of the rear one was kept constant during the tests and measured 40 centimetres. The rear plane was then raised and lowered in relation to the front one, and the forces measured for each position. The arrangement will be clear from the diagram. The rear plane, when tested by itself at an angle of incidence of 2° gave an "absolute" drag coefficient of 0.0208 and a lift coefficient (absolute) of 0.18. When placed behind the other plane (and above or below it) the following values of the lift coefficient were obtained:—

Values of d and d_1 in cm.	K_y for d (Absolute.)	K_y for d_1 (Absolute.)	Values of d and d_1 in cm.	K_y for d (Absolute.)	K_y for d_1 (Absolute.)
0	.0056	.0056	40	.1088	.0960
10	.0472	.0211	50	.1600	.1120
20	.0712	.0448	60	.1232	.1200
30	.0928	.0736	70	.1288	.1312

From the table it will be seen that even when the vertical distance between the two planes is 70 cm. the lift coefficient of the rear plane is very considerably smaller than that of the rear plane when tested by itself, the two values being 0.18 and 0.1312 respectively. As far as could be ascertained by the experiments the drag coefficient remained unaffected for all positions of the rear plane.

A. C. (Waltham Abbey).

Opinions are somewhat divided as to the relative efficiency of two-bladed and four-bladed propellers. For a given diameter there is probably not a great deal of difference between the efficiencies of the two types, but where a four-bladed propeller is used the diameter can be kept smaller, thus making it possible to cut down the height of the undercarriage, which is, of course, equivalent to saying that a saving in resistance can be effected. Full-size helicopters have been built, but to the best of our knowledge none has ever got off the ground with passengers. Scale drawings of the Mersey monoplane have not been published in "FLIGHT," but some excellent photographs and a few sketches, showing various features of this machine, were published in the issue of "FLIGHT" for August 17th, 1912, a copy of which can be obtained from the offices of "FLIGHT." The price is 1s. 7d. post free.

S. J. D. (Highbury).

The pay of a Flying Officer is 12s. a-day (increasing by 1s. a-day for each year of service up to 16s.) plus 8s. flying pay.

J. F. (Wimbledon) and E. M. (Burgess Hill).

Write to the R.N.A.S. Drafting Office, Crystal Palace, S.E.

G. M. (Grantham).

Full description, with scale drawings, photographs and sketches of the Albatros reconnaissance biplane appeared in "FLIGHT" of November 26th, 1915. The Albatros fighting biplane was similarly treated in "FLIGHT" of December 24th, 1915. The L.V.G. fighting biplane was described in "FLIGHT" of June 22nd, 1916.

U. S. (Brockley).

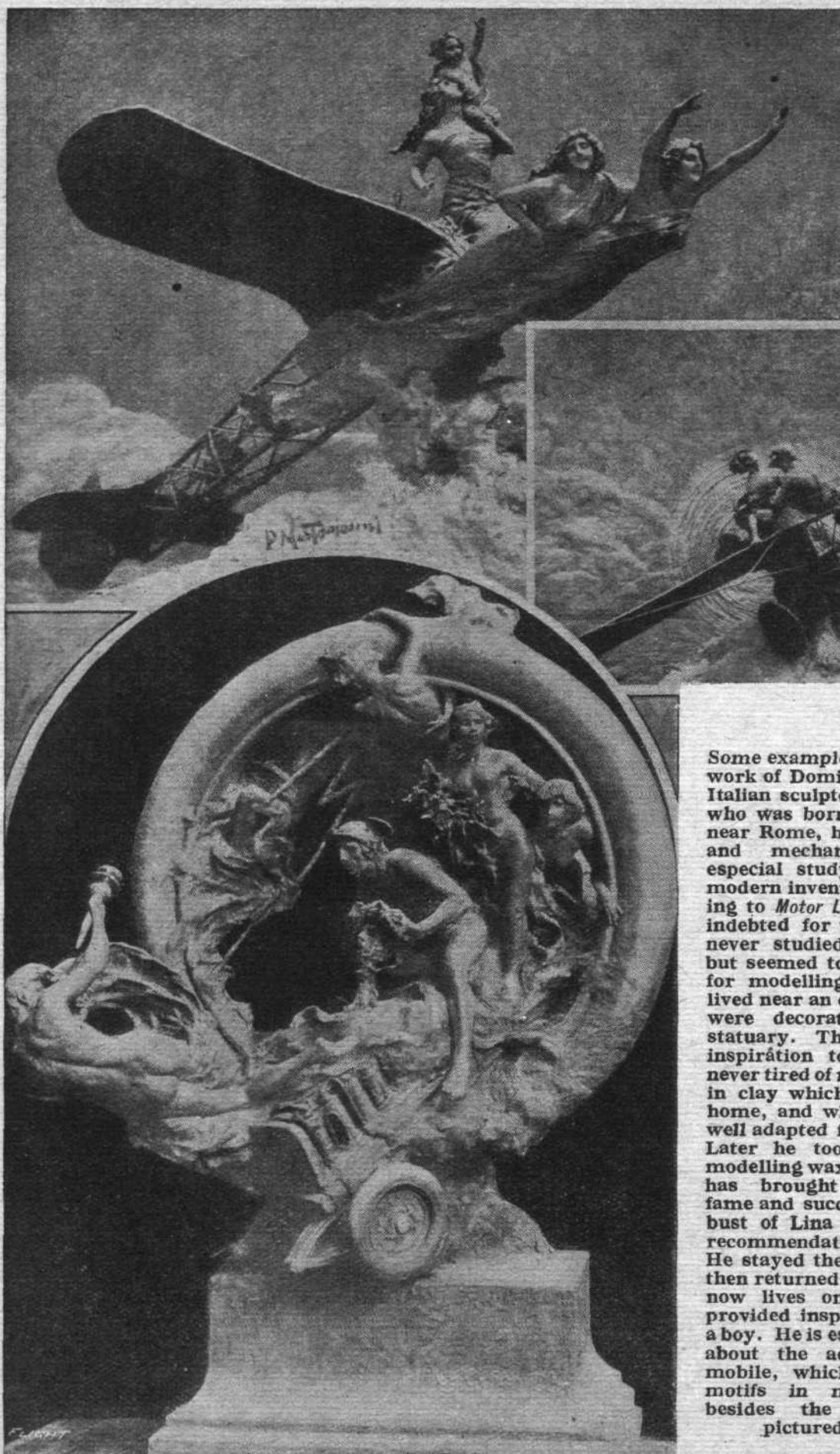
Lincoln Beachy used a Curtiss biplane when he flew over Niagara Falls on June 27th, 1911. A photograph of the machine passing under the upper steel bridge over the falls appeared in "FLIGHT" of August 5th, 1911.

Royal Honour for Flying Services.

It was officially announced on April 13th that the King has been graciously pleased to become Colonel-in-Chief of the Royal Flying Corps (Naval and Military Wings), to mark his admiration of the splendid services which both wings have rendered since the commencement of the war.

Women Storekeepers for the R.F.C.

It is announced that 30 women storekeepers, with knowledge of motor parts, are wanted at once for the Royal Flying Corps. Women who have had a course of instruction in motor driving and who are not now driving would be most suitable for this work. Applications to be made to the Director, National Service, Women's Section, St. Ermin's, S.W. 1.



On the left, "Flight," one of a group of symbolic sculptures suggested by the aeroplane by Dominico Mastroianni.

Below is a characteristic treatment of the aeroplane which is the inspiration of much of Mastroianni's work.



Some examples of the remarkable work of Dominico Mastroianni, an Italian sculptor. M. Mastroianni, who was born in Arpena, a town near Rome, has made aeroplanes and mechanical vehicles his especial study in adapting these modern inventions to art. According to *Motor Life*, to which we are indebted for the reproduction, he never studied in an art school, but seemed to have a natural gift for modelling. When a boy, he lived near an estate whose grounds were decorated with groups of statuary. These proved to be an inspiration to the boy, and he never tired of modelling the statues in clay which he found near his home, and which was peculiarly well adapted for this sort of work. Later he took up the work of modelling wax for tablets, and this has brought him considerable fame and success. He modelled a bust of Lina Cavallieri, on whose recommendation he went to Paris. He stayed there a short time, and then returned to Arpena, where he now lives on the estate which provided inspiration for him when a boy. He is especially enthusiastic about the aeroplane and automobile, which he has used for motifs in many other works besides the three which are pictured on this page.

The power and speed of the automobile are the underlying motifs of this group.

Art and Modern Inventions.

AIRS FROM THE FOUR WINDS

SUNDAY last was the tenth anniversary of the Royal Aero Club's model competition at the Alexandra Palace for prizes offered by the *Daily Mail*. It is almost unnecessary to remind our readers that the leading place was won by Mr. A. V. Roe.

THE military training of a pilot in the R.F.C., as is well known, includes a course of machine-gun firing at objects on the ground, and the following remarkable incident, for the accuracy of which one of our readers vouches, occurred recently at an aerodrome in the South of England. A pilot had been sent up, armed with a Lewis gun and 10 rounds of ammunition, to make his first attempt at a silhouette target on the ground representing an aeroplane. Circling round at a height of 400 or 500 feet he got his aim well on to the target, as he thought, but, unfortunately, it was not the target arranged for, but a real aeroplane which was just being pushed into a hangar. The pilot had just left his seat, which was distinctly lucky, for when the man above fired his 10 rounds, two went through the pilot's seat, two through the right wing, and three mechanics got two rounds each! That marksman has a future before him if he can only do as well when he gets over the German lines, but he must have had an uncomfortable quarter of an hour when he came down to hear what his score was. Fortunately the three mechanics were not seriously injured.

COLONEL LORD MONTAGU of Beaulieu is back again in London. He thus misses the summer in India, which is a little more than he could stand again. During Lord Montagu's stay in India he has done an enormous amount of missionary work for aviation, and has amongst other things been the means of securing £10,000 towards providing a flight of seaplanes for Bombay. He may be going back for another two years, but his presence here just now suggests to us possibilities in the direction of the Air Board. Lord Montagu is full of matters aviatric beyond these shores, and has views of his own regarding the new Italian Capronis as strafers.

EVER ingenious and original is Tommy in his leisure hours. One of his latest pastimes "out yonder" is to build miniature aeroplanes, with cartridge cases as bodies, Belgian nickels as wheels and bully-beef tins doing duty for wings. Quite a unique souvenir medley.

WHEREVER, the world over, there is a reading public, there is known with affection the name of John Oxenham. Not only by his delightful prose works has he held the world's attention in the years that have gone, but to his verses, since collected and published in charming little tomes, must always attach a huge following, from the human touch which almost every little poem carries with it. Therefore, a sympathetic line from John Oxenham the other day was all the more welcome, as it was accompanied by the one-forty-thousandth part of an issue of the Author's "The Vision Splendid," which has but recently been issued by Methuen and Co. In this little volume are gathered together 60 or more of verses "for the times and the times to come," with the dedication "To all those who are looking forward with earnest expectation and steadfast determination to the emergence from this present chaos of a cosmos worthy of God and Humanity in this Twentieth Century of the Christian Era I dedicate this little book in confident hope."

IN itself the collection of verses is acceptable, but the motive of the compliment makes its receipt the more acceptable, the following note from John Oxenham accompanying the little volume:—

"I opened two letters this morning, one after the other—the first was from a lady in Huntingdon whose brother had just been killed in the Flying Corps. She begged me to write some lines for the Flying men. The next was from a lady in Reigate, begging me to send to 'FLIGHT' some lines on the Flying Men which appear in my new little volume of verse, 'The Vision Splendid.' She apparently thinks the boys would appreciate them, and so I am sending you a copy of the book and leave it to your discretion. If you care

to reproduce the lines you are quite at liberty to do so. They were written because my own boy is in R.F.C."

It was on page 26 we found this ode "To the White Knights of the Air Services":—

On Eagles' Wings.

(TO THE WHITE KNIGHTS OF THE AIR SERVICES.)

*Supremely in His Hand are you,
To whom the mighty joy is given
On eagles' wings to climb the blue,
And, on the pinions of the winds,
To sweep the boundless plains of heaven.
So—to your minds
Be present this,
For cheer in your necessities,—*

*Who swings the countless spheres in space,
Yet to their even courses holds;
Who set the firmament in place
And its infinitudes unfolds,—
Come what come may of hap or chance,
He is your sure deliverance.*

*If but as Pilot by your side
He sits, upon Whose breath you ride,
He shall preserve you from alarms,
Spread wide His everlasting arms,
And bear you safely up on high
In His most noble company.*

*No sparrow falls but it is known
Of Him who sits on Heaven's high throne;
And you, in your supremest hour,
Shall feel the uplift of His power,
And know you not alone.*

*Alone? Alone?
None is alone!
For where is one,
There He is too.—
No man goeth alone!*

*Higher than most, to you is given
To live—or in His time, to die;
So, bear you as White Knights of Heaven—
The very flower of chivalry!
Take Him as Pilot by your side,
And "All is Well!" whate'er betide.*

THE above is but one of many others in equally human vein, and, as another verse associated with the navigation of the air, we select the following couple of stanzas from the next page:—

Searchlights.

*The searchlights sweep the sombre skies,—
Slow-wheeling,—focussed here and there,
To catch the lurking treacheries
Within their wide-flung whirling snare;
And when they find the hidden foe
The eager hunters lay him low.*

*God's mightier beams are searching out
The Soul of Life and lighting it,
That His fair hosts may put to rout
The foes that have been blighting it;
Sweep clean, O Lord, and beautify,
And come Thou in and occupy!*

IN the story of the withdrawal from Gallipoli it is being emphasised in the official communication that the enemy was hopelessly deceived as to the date of the final departure from his shores, his artillery fire on the final night of the evacuation being negligible. And well he might be deceived, in spite of incessant spying from above by aeroplane. The ruses which the navigation of the third element has brought into being are well exemplified by the following extract from Vice-Admiral de Robeck's despatch:—

"During the whole time (of the evacuation) there remained the paramount necessity of preventing the enemy gaining intelligence of what was in progress; this added greatly to the difficulties of work during daylight. Enemy aircraft

paid frequent visits to the peninsula; on these occasions, whilst the 'Taube' was in evidence, animals and transports approaching the beaches were turned and marched in the opposite direction, and stores and horses already in lighters were even unloaded on the beaches to give the appearance of a disembarkation."

ONCE in the war, "hustle" is the slogan of the American nation. Last week mention was made of the intention to drop, by means of aeroplanes, German translations of President Wilson's speech over the German lines. As a fact, Mr. James M. Tuohy, the London correspondent of the *New York World*, announces that their Paris correspondent had already actually fixed up on April 7th, with the French authorities that this very effective means of conveying a little wholesome information to the German troops, should be carried through without a moment's unnecessary delay.

It would have been appropriate that the American Lafayette Air Squadron, which has been so actively engaged with the Allies on the Western front, should have been the conveyors of their President's message, by way of consecrating the right now to wear their own country's uniform in the world's conflict.

FOLLOWING the recent glorious work of our pilots at the front, the discussion on the Air Services asked for in Parliament, is more than likely to be put down for the earliest possible date.

POSSIBLY—even probably—this discussion will form one of the chief heart to heart talks assigned to the Secret Session which may be decided upon by the Government.

FROM "The Londoner's Diary":—

"The following piece of red-hot history might well have staggered the imagination of Jules Verne.

"On a certain morning just before the present phase of the Western advance opened a flying squadron set out for France from an inland aerodrome. They took exactly 2½ hours to complete the journey, and sat down to lunch behind the British lines at 1.30. Every machine completed the journey without a single forced landing.

"The following day another complement of learners occupied the aerodrome, and within 72 hours of leaving England the squadron commander, who possesses the double distinction of being an intrepid flyer and a first-class instructor, was back at the flying school, and ready to take his new pupils in hand. In the meantime, however, he had, single-handed, accounted for three German machines. As an instance of super-hustle in doing one's bit, this must surely be hard to beat."

AVIATION now has its very own Masonic Lodge, although its membership is confined to one section of the Services only, viz.: R.N.A.S. Anti-Aircrafters. At the consecration of the new Royal Navy Anti-Aircraft Lodge, No. 3790, by Sir Edward Letchworth, the Grand Secretary, last Saturday morning, a gathering of about 500 very earnest Masons resulted.

THE Bible used in the ceremony and the warrant of the lodge were bound with boards cut from a piece of the propeller of one of the Zeppelins brought down in England, and part of the regalia of the lodge officers was made of aluminium from the Zeppelins brought down at Cuffley and in Essex. Sir Edward Letchworth was assisted in the ceremony of consecration by Admiral Sir Hastings Markham, Rear-Admiral E. F. Inglefield (Provincial Grand Master, Buckingham), Inspector-General Belgrave Ninnis, the Bishop of Willesden, and Mr. G. Woods Wollaston, M.V.O.

LIEUTENANT DONALD ALFRED ELLIOTT, R.N.V.R., was installed as the first Master, with Lieutenant Thomas Wontner Smith, R.N.V.R., as acting I.P.M., and the following in the other offices: Captain L. S. Stansfeld, R.N., C.M.G., and R. R. Hayne, L.R., Wardens; R. P. Hamp, Treasurer; P. C. Webb, L.R., Secretary; G. Woods Wollaston, M.V.O. (Bluemantle), D.G.D.C., Director of Ceremonies; Sub-Lieutenant K. V. Dolleymore and G. E. Kimp, Deacons; E. V. Reynolds, A.D.C.; A. W. M. Marshall, Almoner; F. Pooley, Inner Guard; J. S. Huddleston, D. Neale, G. W. Roberts, F. W. Jackson, and J. W. Taylor, Stewards. There were 60 grand officers present and the lodge has nearly 100 founders.

WITH such a good send-off by way of a lead, we can already see other Air Service Lodges materialising within a measurable period. It is fitting that the controllers of the new form of Craft should join up with *The Craft*.

CURIOUS that following the publication of the title "Dawn?", of our cartoon last week, on the very day of its issue (Thursday), at the American Luncheon Clubs' function at the Savoy, the Prime Minister should, in his really inspired speech, have taken hold of the same text so emphatically. When referring to the glorious work of our Imperial Army in France, Mr. Lloyd George with convincing emphasis and stern earnestness painted a picture for which the whole world must by now long. "To-day," he said, "we are waging the most devastating war that the world has ever seen; to-morrow—perhaps not a distant to-morrow—war may be abolished for ever from the category of human crimes. This may be something like the fierce outburst of winter which we are now witnessing before the complete triumph of the sun. It is written of those gallant men who won that victory on Monday—men from Canada, from Australia, and from this old country, which has proved that in spite of its age that it is not decrepit—it is written of those gallant men that they attacked with the dawn—fit work for the dawn!—to drive out of 40 miles of French soil those miscreants who had defiled it for three years. 'They attacked with the dawn.' Significant phrase!"

WHAT an interesting story "How Squadron Commander Briggs, D.S.O., R.N., reached London" would make to be sure. Since he did his Friedrichshafen strafing he has been through quite a lot of experiences. His being able to personally congratulate S. V. Sippe, D.S.O., R.N., who was also in the same strafe upon his latest promotion to Squadron Commander, should be an agreeable surprise for both sides.

TEN YEARS AGO.

Excerpts from the "Auto." ("FLIGHT's" precursor and sister Journal) of April, 1907. "FLIGHT" was founded in 1908.

THE BLÉRIOT MACHINE.

M. Blériot's determined efforts to get his aeroplane off the ground have at last been crowned by a mild success. On the 5th instant it got fairly off the ground, attaining a height above *terra firma* of 60 centimetres, or a little under two feet, at which elevation it accomplished a "flight" of 6 metres! M. Blériot, being rather alarmed for the safety of his machine after making his flight of 6 metres, cut off the ignition and once more came to the ground.

AEROPLANE MODEL TRIALS.

One of the most promising events which had hitherto been arranged in the aeronautical world was the competition organised by the Aero Club for model flying machines, and in connection with which our contemporary, the *Daily Mail*, offered valuable money prizes. This event took place at the Alexandra Palace on Monday, April 15th; that is to say, immediately after the closing of the Agricultural Hall Show, where, as our readers are aware, the machines in question, and many more besides, had been on exhibition for more than a week. As the result of the trials, the judges awarded the second prize to Mr. A. V. Roe, and the third prize to Mr. W. F. Howard. No first award was made.

THE FILIPPI AEROPLANE.

As a variation on the ordinary aeroplane machine, particulars come from Paris of a device invented by a French engineer named M. Antoine Filippi, which must apparently be classed among the helicopters, although the machine, it seems, is a combination of both principles. In appearance it has rather a bird-like appearance, since it consists of a metal body, outstretched from which, on either side, is a large wing or fin, resembling to a certain extent a blade of some immense propeller. About the centre of each plane thus formed is a circular orifice 1.3 metres in diameter, covered by an openwork cage carrying an electric motor-driven propeller which revolves in the plane of the outstretched wings. When in motion these two propellers convert the machine into a helicopter, but when once lifted up into the air the outstretched wings are available for gliding. It is reported that preliminary tests have already shown the machine to be capable of lifting a load of 700 kilogs. in addition to the electric equipment, but no information is at present available to show what power was being consumed in accomplishing this feat. Steering is accomplished by tilting the propellers, and by the same means these can be utilised for propulsion.

THE DELAGRANGE AEROPLANE TRIALS.

Shortly before 11 o'clock last Saturday morning the Delagrance machine was taken out for another trial, but although some success was attained, the attempts had to be abandoned owing to minor accidents with the framework.

Personals

Casualties.

Lieutenant HARRY ATHELING RUSSELL BOUSTEAD, Middlesex Regiment and R.F.C. (died of wounds received in an aerial action on April 5th), was the fourth and youngest son of John Melvill and Leila Boustead, of Colombo, Ceylon, and of Westfield, Wimbledon Common. He was educated at Harrow, where he reached the sixth form, and became monitor and Head of his House. He then went to University College, Oxford. He won the 100 yards swimming race for Oxford against Cambridge in 1913, and passed out in History Honours in June, 1914. On the outbreak of war he obtained a commission in the Middlesex Regiment, in which his elder brother also obtained one, and he saw active service with his battalion in Egypt against the Senussi. When the battalion returned to Europe he became attached to the Royal Flying Corps. After only one month's training he got his wings, and was sent to the front in October last. He lately brought down two German aeroplanes in one day, and he flew the Channel to France with a new machine a week before his death. He lost his life in an encounter with a hostile machine. His observer was killed, and, though mortally wounded himself, he shook off the Hun and succeeded in recrossing our lines, bringing his machine safely down on our side. He died very shortly afterwards.

Lieutenant E. T. C. BRANDON, Royal Sussex Regiment, attached R.F.C., killed on April 3rd, was the elder son of Mr. and Mrs. Fred Brandon, of Natal, and was 22 years old. He was born and educated in South Africa. After going through the campaign in German South-West Africa, he came to England for the first time in November, 1915, and received a commission in the Royal Sussex Regiment on January 25th, 1916. In June last year he transferred to the R.F.C., and left for the front in September. He was promoted lieutenant last February.

Brevet Major (Temporary Lieutenant-Colonel) CHARLES JAMES BURKE, D.S.O., Royal Irish Regiment, commanding a battalion of the East Lancashire Regiment, who was killed on April 9th, was the youngest son of the late Mr. M. C. C. Burke, of Ballinhone House, Armagh, and was 35 years of age. He served through the South African War, receiving the Queen's medal with two clasps, and afterwards for three years with the West African Frontier Force. He was one of the earliest British military pilots, having qualified on a Farman biplane in France in October, 1910. The same year he was employed at the Aeroplane and Balloon School for some months, and flew the first aeroplane purchased by the British Government. He joined the Air Battalion when it was formed in 1911, and served in the Royal Flying Corps from 1912 until 1916, and was for some time Commandant at the Central Flying School. He was mentioned in despatches in October, 1914, and again in January, 1916, and was awarded the D.S.O. in February, 1916.

News has been received by his sister in Leeds stating that Lieutenant HAROLD NORMAN HAMPSON, R.F.C., died of wounds on April 7th. He went to the front as a piper in the Liverpool Scottish, and after being wounded joined the Inns of Court Officers Training Corps, and received a commission in the South Lancashire Regiment. In February last he was transferred to the Royal Flying Corps. Only last week a letter was received from him stating that he had on April 6th been successful in shooting down two enemy aeroplanes. He was in his 21st year.

Second Lieutenant E. J. HARE, R.F.C., was a member of the South African Civil Service, Department of Railways and Harbours. He was well known in the Transvaal and Western Province of Cape Colony as a fine athlete, sprinter and Rugby footballer, and he played in first-class football in Pretoria and elsewhere. After the Union Defence Force was established he was selected from a large number of volunteers to learn flying, and he qualified at the S.A. Aviation School at Kimberley. He came to England with the original South African Oversea Contingent as a despatch-rider in the S.A. Signal Company, R.E., in which his high spirits and cheerful temperament made him very popular. In October of 1916 he transferred to the Royal Flying Corps. He had all the qualities for a fine airman, and fought in several aerial combats

with great boldness and success, and was soon gazetted to a commission in the R.F.C.

Second Lieutenant K. C. HORNER, R.F.C., died of wounds, was the only son of Mr. and Mrs. C. R. Horner, of Monkbridge Road, Headingley, Leeds. He was 20 years of age, and at the outbreak of war was at the Leeds Grammar School. Second Lieutenant Horner had been flying at the front for three weeks when he received the wounds from which he has since died.

Lieutenant HUGH NORTON, R.F.C., killed in action, aged 24, was the son of Mr. David Norton, of Engedi, Eastbourne, and was educated at the Grange, Eastbourne, and at Wellington College, where he was in the O.T.C. and the "Shooting Eight." After passing two examinations in Chinese at King's College, he was about to go to the Far East for Messrs. Dodwell and Co., Ltd., when war broke out. He joined the Inns of Court O.T.C., and obtained a commission in the Royal Lancaster Regiment, and saw service as a signalling officer in France and the Balkans. After subsequent service in Egypt he became attached to the R.F.C., and had been at the front about three weeks when he was killed.

Acting Squadron Commander JOHN J. PETRE, D.S.C., R.N. (killed on service), was awarded the Distinguished Service Cross in June last year in recognition of his services as a pilot at Dunkirk from February, 1915. He took part in air raids on Ostend and Zeebrugge, during one of which he successfully engaged an enemy aeroplane of the Fokker type, and he carried out many coastal reconnaissances under shell fire. He was promoted Flight-Commander in June, 1916.

Lieutenant JOHN ALEXANDER WILLIAMSON, R.F.C., killed while flying in Leicestershire on April 10th, was the eldest son of Mr. John James Williamson and Mrs. Williamson, a daughter of the late Mr. Martin de Bartolome, and was 21 years old. He was educated at Rose Hill, Tunbridge Wells, and Charterhouse, leaving in July, 1914. He obtained a commission in September following in the Royal East Kent Mounted Rifles, and went with them to Gallipoli, remaining there till the evacuation, when he went to Egypt, and became attached to the R.F.C. He returned to England last August, and after qualifying as a pilot went to the front. Midshipman E. I. Williamson, Lieutenant Williamson's younger brother, lost his life in H.M.S. "Bulwark" at the age of 15.

Missing.

Lieutenant A. G. SEVERS, who was posted as missing last week, was the son of Mr. Frederick Severs, of 11, Vincent Road, Croydon, and was formerly in the Middlesex Regiment, being later on attached to the R.F.C. as an observer. His Commanding Officer, in writing to his father, states that Lieutenant Severs was shot down on March 28th over the enemy's lines, and although there is little hope that he survives, there is just a chance. He was on line patrol with two other machines, when they were attacked suddenly by superior numbers, and the other two machines being damaged were forced to return. The machine in which Lieutenant Severs was observing continued to patrol alone and to protect some other machines that were doing important work. He was then attacked by five fast scouts and the machine brought down. From reports of observers on the ground it is a question whether it landed all right, or was finally not under control. The pilot of Lieutenant Severs' machine was Lieutenant Knight, who is the son of Mr. C. S. Knight, Wingfield House, Banstead, Surrey.

Married and to be Married.

The marriage arranged between Captain C. A. HOOPER, R.F.C., youngest son of Mr. and Mrs. H. S. Hooper, of Shensstone, Lichfield, and JANET ASHLEY, only daughter of Mr. and Mrs. J. A. HALL, Westbury-on-Trym, Bristol, will take place at Henbury to-day (Thursday), April 19th, at 2 p.m.

Items.

The will of Lieutenant WILLIAM HUBERT STUART GARNETT, R.F.C., barrister, Assistant Legal Adviser, National Insurance Commission, killed while flying September 21st, intestate, has been proved at £405.

The British Air Service

PER ARDUA AD ASTRA

Royal Flying Corps (Naval and Military Wings).

London Gazette Supplement, April 16th.
Memoranda.—His Majesty the King to be Colonel-in-Chief of the Royal Flying Corps (Naval and Military Wings).

Royal Naval Air Service.

Admiralty, April 11th.
 Flight-Comdr. S. V. Sippe, D.S.O., granted temp. acting rank of Sqdn.-Comr., date April 7th.

E. St. J. Gwyllyn Bevan and C. H. B. Pinchard granted temp. commissions as Lieut., R.N.V.R., seniority April 9th and April 7th respectively.

The following granted temp. commissions as Sub-Lieuts., to date as stated: Temp. Prob. Flight Officers: J. H. Broughton, April 11th; T. F. Gillespie, April 10th; W. P. Wood, April 10th; and F. K. Wells, April 15th.

The following have been entered as prob. flight officers for temp. service, to date as stated: Mr. A. A. Ferguson, March 29th; E. P. Coleman, C. K. C. Dagg and I. F. Sutherland, April 15th.

Admiralty, April 12th.
 A. Barry granted a temp. commission as Lieut., R.N.V.R., April 11th, and appointed to the "President," additional, for R.N.A.S., to date April 23rd.

G. M. Broadburn granted a commission as Temp. Lieut., R.N.V.R., April 11th, and appointed to "President," additional, for R.N.A.S., to date April 16th.

E. S. Davis granted commission as Temp. Sub-Lieut., R.N.V.R., and appointed to "President," additional, for R.N.A.S., to date April 30th.

The under-mentioned entered as Temp. Prob. Flight Officers, and appointed to "President," additional, for R.N.A.S., all to date April 22nd: E. H. Bailey, W. H. Dickens, and Temp. Sub-Lieut. (R.N.V.R.) J. H. Benthams.

A.M.I. J. C. Fraser promoted to Warrant Officer, 2nd grade (temp.), and appointed to "President" additional, for R.N.A.S., to date April 23rd.

Gunner (R.N.) W. Barber graded as Warrant Officer, 2nd grade, to date April 7th.

Admiralty, April 13th.
 D. K. Glen entered as Prob. Flight Officer. (Temp.), and appointed to "President," additional, for R.N.A.S., date April 6th.

Admiralty, April 14th.
 H. V. Rose and M. W. N. Cross granted temporary commissions as Lieuts., R.N.V.R., both with seniority April 13th.

Royal Flying Corps (Military Wing).

London Gazette, April 10th.
Temporary Appointments at War Office.

Deputy Director-General.—Bt. Col. (Temp. Brig.-Gen.) W. S. Branner, R.A., from a Dir., and to retain his temp. rank whilst so employed; Feb. 28th.

Director.—Bt. Lieut.-Col. L. E. O. Charlton, C.M.G., D.S.O., Lan. Fus., from a G.S.O., 1st Grade, and to be Temp. Brig.-Gen. whilst so employed, vice Bt. Col. (Temp. Brig.-Gen.) W. S. Branner, R.A.; Feb. 28th.

Deputy Assistant Director.—Major and Bt. Lieut.-Col. W. D. Dooner, A. Ord. Dept., from Ord. Officer, 2nd Cl., and Temp. Lieut.-Col.; Mar. 19th.

Deputy Assistant Adjutant-General.—Lieut. (Temp. Major) H. S. Ebben, R.F.C., S.R., from graded as a Park Comdr., and to retain his temp. rank whilst so employed; Feb. 28th.

Staff Captain.—Capt. C. F. Gordon, M.C., N. Staff. R., vice Major D. H. Cameron (ret. pay), Ind. Army; Feb. 28th.

Flight-Commanders, from Flying Officers, and to be Temporary Captains whilst so employed.—Temp. 2nd Lieut. A. Binnie, Gen. List; Mar. 21st. Temp. 2nd Lieut. R. D. Baker, Gen. List; Mar. 27th.

Flying Officers.—Temp. 2nd Lieut. J. Leask, Gen. List (since killed); Feb. 24th. 2nd Lieut. (Temp. Lieut.) R. C. Taylor, R. War. R. (T.F.), and to be sec'd.; Mar. 19th. Mar. 14th: 2nd Lieut. G. C. T. Hadrill, A.S.C., from a Flying Officer (Ob.), seniority June 17th; Temp. 2nd Lieut. (on prob.) C. H. Harriman, Gen. List, Mar. 15th; 2nd Lieut. A. Boon, Manch. R. (T.F.), and to be sec'd.; 2nd Lieut. A. W. Symington, M.C., K. R. Rif. C., and to be sec'd.; Temp. 2nd Lieut. A. Travers, Gen. List; 2nd Lieut. (Temp. Capt.) C. E. Robertson, S.R., from an Equipment Officer, 1st Cl., and to relinquish his temp. rank; 2nd Lieut. R. A. Martin, R.F.A. (T.F.), and to be sec'd.; 2nd Lieut. A. B. Raper, S.R., Mar. 16th; 2nd Lieut. (Temp. Lieut.) F. W. Hartridge, A.S.C., and to be sec'd.; 2nd Lieut. (on prob.) S. Anderson, High L.I. (T.F.), and to be sec'd.; Temp. 2nd Lieut. (on prob.) P. G. Kelsey, Gen. List. 2nd Lieut. F. J. Buckland, S.R.; Mar. 17th. Mar. 18th: Temp. 2nd Lieut. R. W. P. Goodwin, Gen. List; Temp. 2nd Lieut. (on prob.) C. S. Richmond, Gen. List. Temp. 2nd Lieut. (on prob.) N. V. Spear, Gen. List; Mar. 19th. 2nd Lieut. R. Grandy, Newfoundland R.; Mar. 20th.

Memoranda.—The under-mentioned to be Temp. 2nd Lieuts. for duty with R.F.C.: E. D. Leishman; Feb. 8th. Mar. 14th: H. Crouch, J. S. Done, Regt. Q.-Mr.-Sergt. G. A. Richardson, from Yeo. (T.F.). The under-mentioned to be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.:—April 5th: R. C. Clements, F. B. Woods, W. H. Botterill, P. H. Benson, J. W. Atkinson, C. G. Nops, W. H. D. Chamberlain, A. H. Herrington, A. H. Desforges and J. B. Daniels.

General List (R.F.C.).—Temp. 2nd Lieut. M. C. Breeze resigns his commission to resume medical studies, and is granted the hon. rank of 2nd Lieut.; April 11th. The under-mentioned Cadets to be Temp. 2nd Lieuts. (on prob.):—Mar. 17th: R. S. C. D. Ashby, H. J. Ashley, W. Q. Adams, V. C. E. Bracey, F. S. Briggs, G. J. Bowden, O. C. Bridgeman, W. Bourne, G. L. Chesterton, J. A. B. Colin, F. P. Chaplin, A. A. Chapman, P. Carpenter, E. H. Cross, A. S. Cross, N. F. Clarke, A. T. B. Charlesworth, W. Chivers, V. L. Dowling, R. S. J. Dykes, J. E. Day, H. A. Dunningham, G. R. Edwards, H. A. Edwards, F. M. M. Ellis, R. K. Fletcher, D. V. Foot, P. Comte de St. Felix de Mauremont, A. W. E. Gouret, E. D. Gibson, J. P. Glass, N. L. Garstin, G. D. Heathorn, F. C. Hoey, W. Howarth, E. W. Hobbs, G. R. James, F. G. Jones, F. H. Jackson, J. K. Line, R. S. Lloyd, K. A. W. Leighton, J. C. Ludski, E. J. H. Leighton, S. V. R. Lewis, V. Mercer-Smith, W. K. McMillan, C. G. Mallous, O. W. W. H. Meredith, L. N. Mitchell, W. R. Munro, T. L. Osborne, E. Olivier, S. F. Porter, B. G. Poole, W. Pilling, G. Russell, J. H. Russell, S. W. Sparks, E. T. Simpson, R. T. Stevenson, L. W. St. George, C. E. Stuart, L. Stevens, H. G. Tambling, R. W. Tilbury, N. H. Thackrah, W. L. C. White, A. Wald, R. B. P. Wilson, E. V. Wheeler, H. C. Kelly, J. M. S. G. Stevens, G. L. Tapscott and C. G. Salmond.

London Gazette Supplement, April 11th.
 The under-mentioned to be Temp. 2nd Lieuts.:—

For duty with R.F.C.—Sergt. G. W. Ferguson, from A.S.C.; Feb. 13th.
Squadron Commander.—2nd Lieut. (Temp. Capt.) H. V. Champion de Crespigny, M.C., Suff. R., from a Flight-Comdr., and to be Temp. Major whilst so employed; Mar. 21st.

Flight-Commanders.—From Flying Officers, and to be Temp. Capt. whilst so employed:—Mar. 24th: Lieut. G. Alchin, R.E.A. S.R.; Lieut. R. A. Delhaye, S.R. 2nd Lieut. (Temp. Lieut.) L. H. Peter, R.E. (T.F.); Mar. 25th

Flying Officers.—2nd Lieut. J. Noakes, Gen. List; Jan. 1st. Mar. 16th: 2nd Lieut. (Temp. Lieut.) M. Ballard, Durh. L.I. (T.F.), and to be sec'd.; 2nd Lieut. (Temp. Lieut.) G. S. French, Camb. R. (T.F.), and to be sec'd.; 2nd Lieut. (on prob.) L. W. Brooks, Hamps. R. (T.F.), and to be sec'd. Mar. 17th: 2nd Lieut. H. L. Devlin, Arg. and Suthd. Highrs. (T.F.), and to be sec'd.; 2nd Lieut. (on prob.) S. H. Wrinch, W. York. R., S.R., and to be sec'd.; Temp. 2nd Lieut. J. G. Goodyear, Gen. List; Temp. 2nd Lieut. (on prob.) N. M. D. Gen. List; 2nd Lieut. D. A. A. Shepperson, Som. L.I., and to be sec'd.; 2nd Lieut. G. M. Wilkinson, D. of Corn. L.I., and to be sec'd. Mar. 18th: Temp. 2nd Lieut. J. A. Rossi, Gen. List; 2nd Lieut. C. V. Darnell, Conn. Rang., and to be sec'd.; 2nd Lieut. L. H. Smith, Essex R. (T.F.), and to be sec'd.; Temp. 2nd Lieut. J. L. Salway, Gen. List, from an Equipment Officer, 3rd Cl.; Temp. 2nd Lieut. G. C. Twining, Gen. List, from a Flying Officer (Ob.), seniority May 30th. Temp. 2nd Lieut. (on prob.) P. W. Wilcox, Gen. List; Mar. 19th. Mar. 18th, seniority Jan. 10th:—From Flying Officers (Obs.): Capt. J. W. Thomson-Glover, Ind. Army; Lieut. T. M. Dickinson, Ind. Army. Temp. 2nd Lieut. A. N. Donnet, Gen. List; Mar. 18th, seniority July 12th.

Balloon Commander (graded as a Balloon Officer).—Temp. Lieut. S. Wright, M.C., R.E., from a Balloon Officer; Jan. 29th.

Equipment Officers, 2nd Class.—Temp. 2nd Lieut. S. E. H. Orde, Gen. List, from the 3rd Cl., and to be Temp. Lieut. whilst so employed; Mar. 7th. 2nd Lieut. (Temp. Lieut.) J. McCrae, Sea. Highrs., from an Asst. Insp. (graded as an Equipment Officer, 2nd Cl.), and to retain his temp. rank whilst so employed; Mar. 27th.

Memoranda.—Temp. 2nd Lieut. E. E. Clarke, A.S.C., is transf'd. to Gen. List for duty with R.F.C.; April 9th, 1917. Sergt. W. G. Nutter, from T.R. Bn., to be Temp. 2nd Lieut. for duty with R.F.C.; Mar. 14th. The under-mentioned to be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.: Pte. A. C. Hankey, from A. Ord. Dept.; Mar. 10th. Gunner R. C. C. Mitchell, from R.G.A.; Mar. 26th.

Supplementary to Regular Corps.—2nd Lieut. (on prob.) T. R. Field relinquishes his commission on account of ill-health, and is granted the hon. rank of 2nd Lieut.; April 12th. The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank: W. C. Campbell, E. McK. Cockell, C. J. Couchman, C. S. Collingwood. The under-mentioned to be 2nd Lieuts. (on prob.):—April 5th: H. W. Brooks and F. C. E. Dimmick.

Special Reserve of Officers (R.F.C.).—The under-mentioned from an Officer Cadet Unit, to be 2nd Lieuts. (on prob.): Mar. 17th:—R. A. Ayrton, H. J. Air, J. M. Allport, N. C. Ashton, C. A. H. Aspinall, G. T. W. Burdett, J. Baalman, D. C. Barrington, G. H. Bush, R. F. Bush, O. A. Browning, S. L. J. Bramley, L. J. Balderson, R. J. Brownell, T. A. Burns, J. Chesney, V. C. Chapman, A. B. Cochran, S. Cohen, M. J. Clark, J. Cowan, F. P. M. Court, G. L. C. Clifton, C. G. Crane, R. W. Coutts, A. T. Drinkwater, N. P. Dixon, W. Dee, C. W. Duval, H. B. Davis, W. B. Davies, C. W. Davies, W. Elliott, H. J. Forsaith, A. H. Flower, E. P. Fulton, A. F. Fynmore, J. K. Finlay, H. E. Futcher, P. J. Gardiner, F. D. C. Gore, S. J. Gardiner, A. R. Holthouse, L. C. Hornabrook, C. E. Howell, P. S. Haythorpe, R. F. Hyett, A. S. Hunt, J. F. Henderson, H. T. Hammond, A. B. Hill, D. W. Hardie, A. E. Hempel, R. F. Jones, A. R. Jones, F. M. Johnson, A. F. P. James, A. A. James, E. C. Johnston, N. H. Kemp, C. R. Kempson, R. H. Kirkaldy, A. A. Kennedy, J. D. S. Munro, J. R. Moore, C. W. B. Martin, G. G. Mackay, A. N. Mapstone, C. G. Meudell, L. Morrison, R. K. MacKenzie, A. D. Matheson, J. B. Martin, G. N. Moore, P. H. Moody, A. Macdonald, H. M. Matheson, C. H. Newbold, S. F. Napper, A. C. Nutter, J. H. C. Nixon, G. O. Newton, C. H. F. Nobbs, J. A. Phillips, K. W. Payne, P. E. Palmer, W. G. Preston, E. S. Pitman, A. E. Palfreyman, T. H. N. Powell, E. W. Powell, A. W. Porter, W. Perkins, H. E. Rydon, P. Rawlinson, F. S. Reed, L. Reed, C. M. Ross, S. G. Robinson, R. H. Richardson, H. J. W. Roberts, C. R. Richards, D. O. Robinson, F. D. Slee, S. J. Schooley, W. C. Sidaway, F. Smith, A. J. Stopford, F. G. Sutton, J. McF. Stewart, W. G. Salmon, H. J. Thornton, H. G. Timney, J. M. Thomson, R. G. Turner, G. A. Wells, E. J. Watson, F. P. Watts, A. C. Watson, C. F. Le Poer Trench, C. E. Kingsford-Smith, C. B. Maddocks and E. Hughes.

London Gazette Supplement, April 12th.
Flying Officer (Observer).—2nd Lieut. O. S. Waymouth, Ind. Army Res. of Off.; Jan. 1st, seniority Oct. 10th.

Special Appointment (graded as a Park Commander).—2nd Lieut. (Temp. Lieut.) H. G. Gold, S.R., from a Special Appt. (graded as an Equipment Officer, 2nd Cl.), and to be Temp. Major whilst so employed, vice Lieut. (Temp. Major) H. S. Ebben, S.R.; Feb. 28th.

Supplementary to Regular Corps.—2nd Lieut. W. R. Lewis to be Lieut.; Dec. 13th.

London Gazette, April 13th.
Flying Officers.—2nd Lieut. (Temp. Capt.) J. O. Leach, M.C., Middx. R., reverts from a Flight-Comdr. at his own request, and relinquishes the temp. rank of Capt.; Mar. 24th, but to retain seniority as a Flying Officer from July 8th. Lieut. B. McE. A. Hay, Hrs., and to be sec'd., from Feb. 13th to Mar. 7th. Mar. 1st: 2nd Lieut. R. C. W. Morgan, S. Wales Bord., S.R., and to be sec'd.; 2nd Lieut. (on prob.) N. R. Anderson, S.R. Mar. 19th: Temp. 2nd Lieut. A. W. Spence, Middx. R., and to be transf'd. to Gen. List; Temp. 2nd Lieut. R. W. M. Davies, Northd. Fus., and to be transf'd. to Gen. List; 2nd Lieut. P. C. S. O'Longan, R. Ir. Regt., and to be sec'd.; Mar. 20th: Lieut. J. W. F. Neill, R. Scots, S.R., and to be sec'd.; Temp. 2nd Lieut. H. F. W. Bailey, R. Berks. R., and to be transf'd. to Gen. List; 2nd Lieut. (on prob.) T. A. Doran, Manch. R. (T.F.), and to be sec'd.; 2nd Lieut. G. G. Banting, E. Surr. R., and to be sec'd.; Temp. 2nd Lieut. C. Cornelius-Wheeler, Gen. List; Temp. 2nd Lieut. C. M. Bailey, Gen. List; Temp. 2nd Lieut. E. H. G. Sharples, Gen. List; Temp. 2nd Lieut. (on prob.) A. Critchley, Gen. List; Temp. 2nd Lieut. (on prob.) P. Robinson, Gen. List.

Equipment Officers, 1st Class.—Temp. Lieut. J. H. Banks, Gen. List, from the 2nd Cass, and to be Temp. Capt. whilst so employed; Mar. 1st.

2nd Class.—2nd Lieut. C. G. Nevatt, S.R., from the 3rd Cl., and to be Temp. Lieut. whilst so employed; Mar. 1st.

3rd Class.—Mar. 14th: Temp. 2nd Lieut. H. Crouch, Gen. List; Temp. 2nd Lieut. J. S. Done, Gen. List; Temp. 2nd Lieut. S. J. Fountain, Gen. List; Temp. 2nd Lieut. W. G. Nutter, Gen. List; Temp. 2nd Lieut. G. A. Richardson, Gen. List; Temp. 2nd Lieut. B. Taplin, Gen. List. 2nd Lieut. (on prob.) T. Sherman, S.R.; Mar. 16th.

Memoranda.—Sergt. H. V. Jerrard, from R.F.C., to be 2nd Lieut. for duty with R.F.C.; June 4th. (Substituted for the notifications in the *Gazettes* of July 3rd and Aug. 3rd.) The under-mentioned to be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.: Sub-Lieut. C. Freyberg, from R.N.V.R.; Mar. 14th. L.-Corpl. C. W. Hogg, from Army Ord. Dept.; Mar. 20th. The under-mentioned to be Temp. 2nd Lieuts. for duty with R.F.C.:—Mar. 14th: Pte. S. J. Fountain, from A.S.C.; Pte. B. Taplin, from E. Kent R. (T.F.). The under-mentioned from R.F.C. to be Temp. 2nd Lieuts. (on prob.) for duty with the Mil. Wing; April 5th: 2nd Cl. Air-Mech. F. T. Wheatley, Sergt.-Major A. E. Lindon.

London Gazette Supplement, April 15th.

Flight-Commanders.—Capt. J. W. Thomson-Glover, Ind. Army, from a Flying Officer; Mar. 19th. From a Flying Officer, and to be Temp. Capt. whilst so employed: Temp. 2nd Lieut. C. C. Brill, Gen. List; Mar. 31st.

Flying Officers.—Mar. 13th: 2nd Lieut. (on prob.) J. C. Crosbie, R.G.A., S.R.; 2nd Lieut. (on prob.) S. Thompson, Gen. List. 2nd Lieut. C. A. Stevens, W. Rid. R., and to be secd.; Mar. 14th. Mar. 15th: 2nd Lieut. (on prob.) O. L. MacMicking, Yeo. (T.F.), and to be secd.; 2nd Lieut. (on prob.) S. H. A. D'Arcy, S.R. Capt. W. J. Mostyn, L'pool. R. (T.F.), and to be secd.; Mar. 16th. 2nd Lieut. F. Rose, E. York. R., S.R., and to be secd.; Mar. 17th. Mar. 19th: Lieut. (Temp. Capt.) S. P. Gamon, Ches. R. (T.F.), from a Flying Officer (Ob.), with seniority May 12th; 2nd Lieut. (Temp. Lieut.) E. G. Leake, Manch. R. (T.F.), and to be secd. Mar. 20th: Temp. Capt. J. Leacroft, Gen. List, from a Flying Officer (Ob.), seniority June 20th; Temp. 2nd Lieut. S. F. Allabarton, Gen. List; Temp. 2nd Lieut. B. C. Jones, Gen. List. Mar. 21st: 2nd Lieut. A. M. Wray, E. Kent R., and to be secd.; Temp. Lieut. L. N. T. Stuart-Campbell, British W. Indies R.; 2nd Lieut. J. S. Turnbull, Worc. R., and to be secd.; Temp. 2nd Lieut. (on prob.) E. D. Jennings, Gen. List. Mar. 22nd: Lieut. (on prob.) L. G. Robinson, M.C., Res. of Off., from A. Cyclist Corps; 2nd Lieut. (on prob.) B. Smith, Essex R. (T.F.), and to be secd.

Balloon Commanders.—2nd Lieut. (Temp. Lieut.) C. M. Down, Herts. R. (T.F.), from a Balloon Officer; Mar. 22nd. Mar. 30th: From Balloon Officers, and to be Temp. Lieuts. whilst so employed: Temp. 2nd Lieut. E. A. Cleaver, Gen. List; 2nd Lieut. J. Mitchell, S.R.

Balloon Officers.—Mar. 13th: Temp. 2nd Lieut. G. C. Pilgrim, Gen. List; 2nd Lieut. I. Gluckstein, R. W. Kent R. (T.F.), and to be secd.; 2nd Lieut. (on prob.) V. M. C. B. de Savigny, York, and Lanc. R., S.R., from a Flying Officer. From Equipment Officers, 3rd Cl.: Temp. 2nd Lieut. J. H. A. Byrne, Gen. List; Temp. 2nd Lieut. T. B. Fraser, Gen. List; Temp. 2nd Lieut. C. H. Stafford, Gen. List.

Memoranda.—The under-mentioned to be Temp. Lieuts. whilst serving with R.F.C.:—Mar. 1st: 2nd Lieut. J. C. C. Piggott, D. of Corn. L.I.; Temp. 2nd Lieut. E. Kent, Essex R. (since died of wounds); 2nd Lieuts.: G. B. McMichael, Hereford R. (T.F.); W. H. Ryder, Yeo. (T.F.); F. J. Marsden, Yeo. (T.F.); H. J. Buchanan-Wollaston, Yeo. (T.F.); J. V. L. Hall, H.A.C. (Inf.) (T.F.); G. Bryers, Northd. Fus. (T.F.). Temp. 2nd Lieuts.: D. F. Woodford, R. Suss. R.; D. R. C. Lloyd, J. Robertson, R. M. K. Denning. H. G. Stevenson, R.G.A. Temp. 2nd Lieut. J. B. Waddoup, Gen. List, to take rank and precedence in the Army and in the R.F.C. as if his appointment bore date Jan. 30th. J. M. Pinkerton to be Temp. 2nd Lieut. (on prob.) for duty with R.F.C.; April 5th.

London Gazette Supplement, April 16th.

The under-mentioned to be 2nd Lieut. for service in the field: Somerset L.I., Sergt. Edward Porter, from R.F.C., and to be sec. for duty with R.F.C.; Mar. 11th.

The under-mentioned to be Temp. 2nd Lieuts. for duty with R.F.C.: Sergt. W. T. Walder, Mar. 10th; Sergt. E. C. E. Derwin, Mar. 16th.

Flight-Commander.—2nd Lieut. (Temp. Capt.) H. L. H. Owen, Dorset R. (T.F.), from a Flying Officer, and to retain his temp. rank whilst so employed; Mar. 31st.

Flying Officers.—Temp. 2nd Lieut. (on Prob.) C. H. Halse, Gen. List; Feb. 6th. Lieut. H. D. P. Okeden, Australian Light Horse; Mar. 21st. Mar. 23rd: Lieut. T. C. Creaghgan, Canadian Gen. List; Lieut. J. H. H. Goodall, York, and Lancs. R. (T.F.), and to be secd.; Temp. 2nd Lieut. R. J. Montgomery-Moore, K.R. Rif. C., and to be transf'd. to Gen. List; Temp. 2nd Lieut. K. G. Cruickshank, Gen. List, from a Flying Officer (Ob.), seniority June 1st; Temp. 2nd Lieut. W. MacLanachan, attd. Arg. and Suthd. Highrs., and to be transf'd. to Gen. List; 2nd Lieut. W. G. Breen-Turner, R.W. Fus. (T.F.), and to be secd. Mar. 24th: Capt. A. Dennis, Suff. R. (T.F.), and to be secd.; 2nd Lieut. W. F. Simpson, S.R.; Temp. 2nd Lieut. (on prob.) E. P. P. Edmonds, Gen. List. Mar. 25th: Temp. Lieut. R. G. Hughitt, attd. Northd. Fus., and to be transf'd. to Gen. List; Temp. 2nd Lieut. H. Lambert, Lan. Fus., and to be transf'd. to Gen. List.

Flying Officers (Observers).—Temp. 2nd Lieut. J. A. Morgan, Shrops. L.I.; Feb. 23rd, seniority Oct. 9th. 2nd Lieut. L. Holman, Hrs., and to be secd.; Mar. 22nd, seniority Oct. 11th. Temp. Lieut. J. Rees, Gen. List; Mar. 21st, seniority Oct. 31st. 2nd Lieut. (Temp. Lieut.) C. F. Lodge, Worc. R. (T.F.), and to be secd.; Mar. 16th, seniority Nov. 10th. 2nd Lieut. W. Pallister, W. York. R. (T.F.), and to be secd.; Mar. 23rd, seniority Nov. 15th. Temp. 2nd Lieut. (on prob.) J. R. Smith, Gen. List; Mar. 21st, seniority Nov. 25th. Temp. Lieut. W. H. Ritter, A. Cyclist Corps, and to be transf'd. to Gen. List. Mar. 25th, seniority Dec. 1st. 2nd Lieut. (Temp. Lieut.) F. A. Whitfield, R. War. R. (T.F.), and to be secd.; Mar. 21st, seniority Dec. 3rd. Temp. 2nd

Lieut. E. Rhodes, Manch. R., and to be transf'd. to Gen. List; Feb. 23rd seniority Dec. 21st. Temp. 2nd Lieut. W. R. Cox, D. of Corn. L.I., and to be transf'd. to Gen. List; Mar. 25th, seniority Dec. 23rd. 2nd Lieut. G. N. Blennerhassett, R. Ir. Fus., S.R., and to be secd.; Mar. 24th, seniority Dec. 31st. Temp. 2nd Lieut. A. McKimmie, W. York. R., and to be transf'd. to Gen. List; Mar. 21st; seniority Jan. 1st. Lieut. R. C. Jenkins, M.C., D. of Corn. L.I., and to be secd.; Feb. 25th, seniority Jan. 9th. Temp. 2nd Lieut. (on prob.) L. W. Middleton, Gen. List; Mar. 25th, seniority Jan. 15th. Temp. 2nd Lieut. J. E. Middleton, Gen. List; Mar. 23rd, seniority Jan. 21st. Temp. 2nd Lieut. (on prob.) F. G. Taylor, Gen. List; Mar. 22nd, seniority Jan. 22nd. Lieut. H. A. Laws, Canadian Mtd. Rifles; Mar. 24th, seniority Jan. 24th. Mar. 23rd, seniority Jan. 25th: Lieut. (Temp. Capt.) N. W. Kirkby, York. R. (T.F.), and to be secd.; Temp. 2nd Lieut. C. J. Poole, attd. R. Fus., and to be transf'd. to Gen. List; 2nd Lieut. G. C. Burnand, S.R., from an Equipment Officer, 3rd Class. Mar. 26th: 2nd Lieut. (on prob.) B. C. Moody, Lond. R. (T.F.), seniority Jan. 25th, and to be secd.; 2nd Lieut. (Temp. Lieut.) C. W. Wilson, A. Cyclist Corps, seniority Feb. 4th, and to be secd.

Balloon Officers.—Mar. 13th: Capt. (Temp. Maj.) J. H. Davies, Ches. R. (T.F.), with seniority from Oct. 20th, 1916, and to be secd.; 2nd Lieut. O. L. Vetter, S.R., from an Equipment Officer, 3rd Class; Temp. 2nd Lieut. C. Channing, Gen. List, from an Equipment Officer, 3rd Class; Temp. 2nd Lieut. (on prob.) L. Quartermain, Gen. List; Temp. 2nd Lieut. J. H. Solomon, Gen. List.

Equipment Officers, 2nd Class.—From the 3rd Class, and to be Temp. Lieuts. whilst so employed: Temp. 2nd Lieut. L. P. Ball, Gen. List; Mar. 15th. 2nd Lieut. M. Keegan, R. Dub. Fus.; Mar. 26th.

3rd Class.—2nd Lieut. W. N. Cronshaw, E. Lan. R. (T.F.), and to be secd.; Oct. 14th. Temp. 2nd Lieut. C. J. Hallward, Gen. List; Mar. 20th. 2nd Lieut. G. G. Kitson, S.R.; Mar. 21st.

Central Flying School.

Assistant Commandant.—Capt. (Temp. Lieut.-Col.) L. A. Strange, M.C., Dorset R., from a Comdt., R.F.C. School of Aerial Gunnery (graded as a Wing Comdr.), to retain the grading of Wing Comdr., and his temp. rank whilst so empld.; April 1st.

Memoranda.—The under-mentioned to be Temp. Lieuts. for duty with R.C.F.:—Mar. 1st, 2nd Lieuts. J. E. S. P. Bradford, W. Rid. R.; H. A. Edridge-Green, R. W. Fus. Temp. 2nd Lieuts.: H. E. Freeman-Smith, R.E., F. W. A. Vickery, Durh. L.I. 2nd Lieuts.: E. J. H. Douch, R.G.A.; W. Hellmore, R.A.; H. C. Ainger, R. Scots, S.R.; C. S. T. Lavers, W. York. R., S.R.; C. B. Catnach, Northd. Fus. (T.F.); H. E. Darrington, Middx. R. (T.F.); T. Margerison, Cyclist Bn. (T.F.); E. W. Monk, Lon. R. (T.F.); A. L. Smith, Sea. Highrs. (T.F.); W. Whittaker, Lanc. Fus. (T.F.); D. M. Hodgson, F. York. R. (T.F.); W. L. Dingley, Ches. R. (T.F.). Temp. 2nd Lieuts.: A. V. Blenckron, M.C.; F. T. Bright, F. M. C. Houghton, A. P. Kelly, W. G. Scotcher, M.C., C. Street. 2nd Lieuts.: L. A. Norris, R.E.; W. Gray, Gord. Highrs., S.R.; R. A. Raleigh, Lond. R. (T.F.); A. N. MacQueen, Gord. Highrs. (T.F.); E. F. Matthew, R.F.A. (T.F.). Temp. 2nd Lieut.: V. C. Morris. The under-mentioned Cadets to be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.:—Mar. 28th: R. H. Tooley, H. G. L. Thompson, A. W. Scott, T. O. Davis, F. H. May, A. S. Anderson, C. W. T. Paull, R. S. V. Morris, W. E. G. Cutler, V. T. Boulger, W. A. Lane, H. A. Hewitt, R. S. Bell, J. Davidson. E. F. Moulder; April 5th.

Supplementary to Regular Corps.—2nd Lieut. G. H. Lee relinquishes his comm. on account of physical unsuitability as a Flying Officer; April 17th. 2nd Lieut. A. B. Albert resigns his comm., April 17th. The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank: R. D. Whitt, J. G. Crang, Count L. T. R. di Balm, N. R. Anderson, R. Neilson, Sir C. C. Mansel, Bart. A. S. Shepherd, G. G. Kitson, S. H. A. D'Arcy, C. Q. Steel, E. H. Wilding, A. W. Chapman, J. S. V. Stephen, W. F. Simpson. The under-mentioned to be 2nd Lieuts. (on prob.): W. E. G. Sillick; Mar. 10th. F. Thomas; Mar. 14th. W. H. Glaser; Mar. 16th. Mar. 19th: G. H. Thomas, A. P. Sargeant, F. D. Brooker. Mar. 29th: A. F. Warner, A. H. Barnard, G. M. Erroll.

Aeronautical Inspection Department.*London Gazette Supplement, April 2nd.*

The under-mentioned to be Temp. Hon. Lieuts., without Army pay or allowances, whilst employed as Assistant Inspectors, A.I.D. Mar. 1st: J. D. Campbell, E. S. Hallett, F. Gay, R. E. Rollings, H. S. Hewitt, J. I. Napier.

London Gazette Supplement, April 14th.

The under-mentioned to be Temp. Hon. Lieuts. (without Army pay or allowances) whilst employed as Assistant Inspectors, A.I.D. Feb. 1st: R. W. Everett, J. O. Meyer, T. Rowntree, W. H. Nicholl, J. H. Smith.

**Honours for the R.F.C.**

It was announced in a Supplement to the *London Gazette* on April 17th that the King has been pleased to confer the Military Cross on the following Officers in recognition of their gallantry and devotion to duty in the field:—

1st. THOMAS GERALD GLYNN BOLITHO, R.F.C., Spec. Res.

When his balloon was attacked by a hostile aeroplane he saw his observer safely out, and then descended by parachute himself. He has at all times set a fine example, and has done much to preserve a high standard of efficiency in his section.

2nd Lt. (Temp. Lt.) CHARLES FROLIOTT DENNING,
R.W. Surrey R., Spec. Res., and R.F.C.

When acting as escort to a reconnaissance machine, he attacked a hostile machine and succeeded in forcing it to land. Later, he landed beside the hostile machine, which was on fire, and extinguished the fire.

2nd Lt. (Temp. Lt.) OSBERT RICHMOND KNIGHT,
R.W. Surrey R., and R.F.C.

When attacked by two hostile machines, although wounded he succeeded in driving the two machines away, and continued to observe for his battery. Later he again drove off an enemy machine and continued his observation.

2nd Lt. (Temp. Capt.) JAMES LEITH LEITH, Hamp. R. and R.F.C.

When leading a formation of five machines he drove down one of 11 hostile scouts which attacked his patrol. He completed his reconnaissance, and, although again attacked, succeeded in leading his patrol safely back to our lines. On previous occasions he has brought down three hostile machines.

1st. WILLIAM GEOFFREY MEGGITT, Welsh R., Spec. Res., and R.F.C.

While one of a patrol engaging five hostile machines, he drove down one enemy machine and then attacked another, which was seen to go down vertically. He has previously brought down three hostile machines.

Temp. 2nd Lt. GEORGE KENNETH SIMPSON, R.F.C., late R.G.A., Gen. List.

While observing from a balloon which was set on fire, he went to the assistance of his fellow-observer, and would not leave the balloon himself until he had seen the other observer clear. He was severely burnt.

The following has been awarded the Military Medal for bravery in the field:—

Po. 578 (S.) Pte. J. COLLINSON, R.M.L.I., attd. R.F.C.

THE USE AND ABUSE OF STEEL.

By Lieut.-Col. R. K. BAGNALL-WILD and Lieut. E. W. BIRCH.

(Continued from page 355.)

ANOTHER great source of danger, which must arise in certain cranks made in the ordinary way, is due to design. Designers naturally endeavour to curtail the dimensions of an engine. In one or two cases of engines of the twelve-cylinder Vee type, this was effected by the substitution of roller bearings for the ordinary plain bearings.

It was next suggested that the cranks should be made from a double width billet so that the twist would not exceed 60 degrees. (Fig. 7.) This certainly improved matters, but did not entirely obviate the doubtful structure obtained in the twisted journals.

Various other methods were then tried; cranks were cut

Fig. 3.

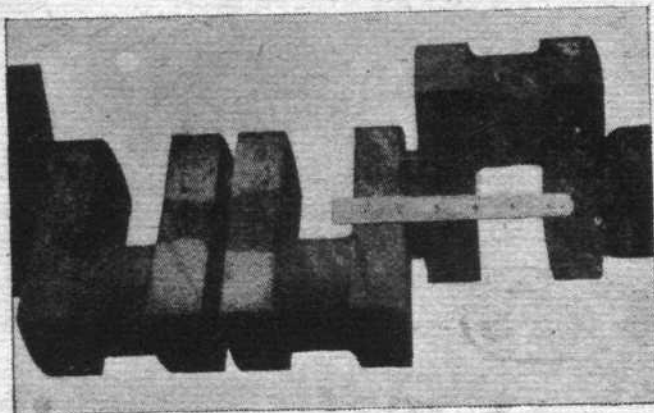


Fig. 4.



Fig. 5.



Fig. 6.



Fig. 7.

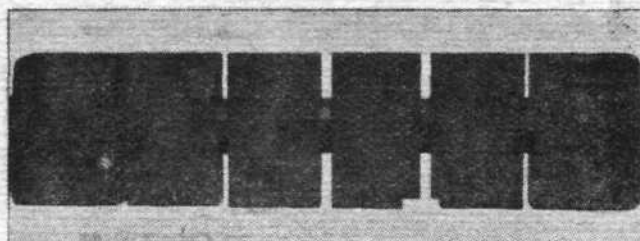


Fig. 4.—Crank from single width billet ready for twisting 120 degrees; 6-cyl. vertical engine. Fig. 5.—Crank from single width billet twisted 120 degrees. Fig. 6.—Rough machined six-throw crank ready for final machining. Fig. 7.—Double width billet slotted prior to twisting 60 degrees.

The cranks were to be made from billets twisted through 120 degrees; and the main journal where the twists had to be made was approximately $\frac{1}{8}$ in. (Figs. 3, 4 and 5, and Fig. 6) in length between the webs. It was anticipated that serious damage to the steel would result, since in order to twist the shaft, it had to be raised locally to so high a temperature that subsequent heat-treatment could not restore the steel to such a structure as is required to give the physical properties demanded by the specification and desirable for the safety and life of the crank.

A number of tests were made on these cranks after final heat-treatment, with the following results:—

	Yield Stress. Tons per sq. in.	Max. Stress. Tons per sq. in.	Elongation per cent. on 1.5 in.	Reduction of area, per cent.
Straight Portion of Crank ..	56.8	62.8	15.3	42.3
Twisted Portion of Crank ..	51.3	56.8	20.7	56.2
	—	53.5	1.33	0.28
	—	52.5	1.67	0.25

from the round, and they were also forged into trifoliate section; the latter is thought to be promising. If it is possible in the design to have, from the steel maker's point of view, a reasonable distance between the webs, it is obvious that some form of pressing from a bar billet gives the most suitable structure in the shaft. The flow of the metal is then continued through the journals, up the webs, along the pins, and so throughout the shaft (Fig. 8), but such a form of combined stamping and forging is not possible with the very short main bearing.

It is essential that the greatest possible care and supervision be given to the use of alloy steels, not only by those who are actually operating, but by the heads of departments who have the necessary technical and metallurgical knowledge. A reluctance to heat-treat after working used to be prevalent, and the necessity for heat-treating after bending, welding or stamping, &c., was not fully recognised. Many firms were quite content to receive stampings as stamped; in some cases they normalised them, but such a process as quenching and tempering was regarded as a luxury or a fad.

Another drawback to progress was the fact that a number of steels were known by certain trade names, and were in fact

Fig. 8.

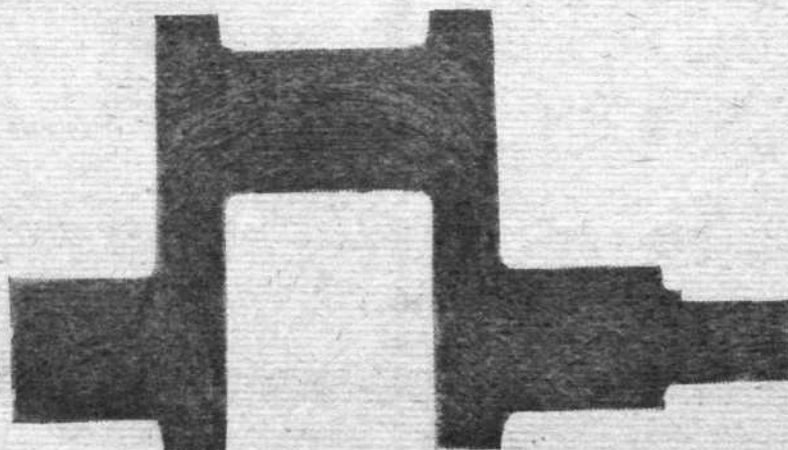


Fig. 9.

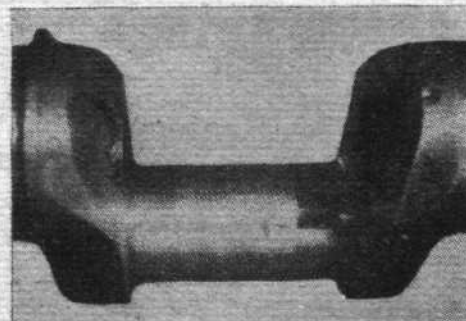


Fig. 10.



Fig. 8.—Sulphur print from longitudinal section of forged and stamped crankshaft. Fig. 9.—“Hair cracks” on crankshaft pin. Fig. 10.—Developed surface of crankpin, showing fracture and hair cracks.

proprietary articles. They were ordered as such, and no mention of any physical test was made on the order. The Royal Aircraft Factory specifications helped to break down this troublesome custom, and have most certainly widened the market and source of supply.

A big difficulty had to be overcome where a small steel maker produced a comparatively large output of crucible steel, which as produced was as near perfect as possible. Firms such as this greatly enlarged their plant, introduced the electric furnace, and other modern improvements, but in some cases the increased output was not as satisfactory as the previous small supply; in other words, they had to learn and adopt new methods under difficult conditions. There was a general tendency on the part of manufacturers of aircraft to flood some of these small steel makers with orders, and a considerable amount of disappointment and trouble was experienced when the quality fell off.

There is another point which makes steel production at the present moment somewhat difficult in that the raw materials now available are variable. Pig iron (known by trade classification), instead of being uniform in composition as before the war, now may vary within very wide limits. As a result of this variation there is no doubt that each charge becomes a separate metallurgical problem, and it is only by reason of the great skill exercised by the steel makers that a relatively high degree of perfection has been maintained in the high grade alloy steels. Many of the troubles experienced with regard to "hair cracks" are undoubtedly traceable not only back to the ingot, but to the steel making.

This brings forward a matter of very great importance. From the point of view of the purchaser it has been a custom in specifications for steel, to deal only with the physical properties, and no attempt has been made to specify the method of manufacture other than generally to determine the process, that is to say, whether steel should be acid open hearth, crucible, &c.

Some interesting experiments have recently been carried out with a view to ascertain if crankshafts with "hair cracks" (Fig. 9) are dangerous, having regard to their life.

Assuming in the first place that a crankshaft has only a certain life, it was thought that minor "hair cracks," scarcely visible to the eye, should not cause the rejection of a shaft, if it could be proved that such cracks do not develop before the shaft has become worn out, due to stress reversal. With this in view, an engine was tested with a crankshaft which showed certain cracks; it was proposed to run the engine for 100 hours, but the crankshaft broke at 78 hours.

The break was a very interesting one, in that it was quite clear that it developed from the "hair cracks."

It is certain that "hair cracks" (Fig. 10), although longitudinal, are undesirable, as they form a starting point for circumferential fractures. In many cases the cracks can be traced from end to end of the shaft. There is no definite proof that these "hair cracks" open out during a short period of running, but there is evidence that after 50 or 100 hours'

work, they show signs of developing, and in some cases, as stated above, cause fracture of the shafts. It is obvious, too, that such cracks on a pin running in a white metal bearing must have a disturbing influence on the surface of the white metal.

All evidence goes to show that these "hair cracks" are derived from defects in the ingot. It is clear that they should not exist, and with this in view the possibility of including a clause in the specification dealing with all work on the ingot, including cropping, cogging, &c., must be considered.

Fig. 11 shows another source of trouble. This shaft had cracked circumferentially on straightening; after heat-treatment, the shaft broke as shown.

It would not be advisable to introduce into specifications clauses that would hamper the steel maker. There is no doubt, however, that some clause dealing with the dimensions of the ingot for certain purposes is most desirable. This is especially so with regard to crankshaft steel.

It is not economical to lay down a definite crop for every type of ingot, or even perhaps individual ingots. Some

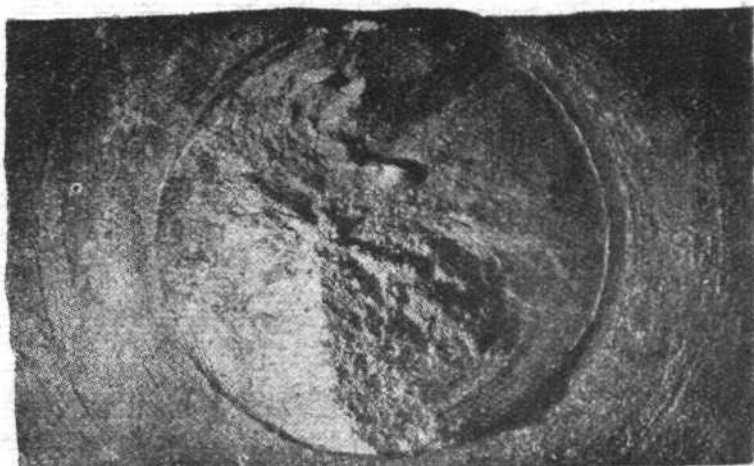


Fig. 11.—Fracture of crankshaft pin during straightening operation.

ingots undoubtedly require more than others. The difficulties may possibly be overcome by insisting on the cranks being forged down from ingots split either into two or four, preferably the latter. The amount of crop necessary, and even the desirability of using the particular ingot, could then be more readily judged. It is noted that the practice of turning blooms all over before cogging down is becoming more prevalent. This undoubtedly saves wastage at a later date, and eliminates to a great extent surface defects.

(To be continued.)

AIR WORK IN THE ADVANCE.

Writing on April 10th, the *Times* special correspondent at British Headquarters said:—

"I hear gunners speak almost with adoration of our airmen, and the airmen tell in glowing terms of the splendour of our infantry advance and the magnificent audacity of the 'Tanks.'"

Writing to the *Daily Telegraph* on April 11th, Mr. Philip Gibbs said:—

"Flights of British aeroplanes were on the wing, and German aeroplanes tried to fight their way over our lines. I saw several air combats, and the grey sky was filled with the swish of machine-gun bullets and the high whining shells of the British 'Archies.' I have never before seen so great a conflict in the skies. It was a battle up there, and as far as I could see we gained a mastery over the enemy's machines, though some of them were very bold."

The correspondent of the *Journal*, writing of the fight for Vimy, said:—

"Two frightful barrages of fire cross each other, and four observation balloons ascend, from which the Germans essay to get their range. One is brought down, while another goes off at the mercy of the winds, its anchor-line having been cut."

Reuter's correspondent, writing of the Vimy ridge, said:—

"Aerial photographs of this great stronghold, taken before hammering at it and the preliminary attack on Sunday

morning, reveal a system of defence which might well have been deemed impregnable. Row after row of wire, each line many yards deep, a perfect honeycomb of trench-work, and countless dominating machine-gun positions had to be overcome."

"The work our airmen continue to carry out is nothing short of marvellous."

The *Times* correspondent, writing on April 13th, said:—

"All the troops engaged here praise very highly the behaviour of our airmen, who stayed up for hours, in spite of a storm of snow, flying very low, using their machine-guns on the enemy, and giving invaluable assistance to our guns by marking the German batteries."

Mr. Philip Gibbs on the same day, said:—

"During this fighting our airmen have flown with extraordinary valour, and have done great work. They flew in snowstorms, as I saw them, and marvelled, on the east side of Arras, and circled round for hours, taking photographs of the enemy's positions and spotting his batteries so accurately, in spite of weather which half blinded them, that the German gunners, now our prisoners, say that they were terrorised by being made the targets of our fire."

Mr. W. Beach Thomas, in his message to the *Daily Mail* on April 13th, throws another sidelight on the air work:—

"The Canadian attack robs the Germans of their last point of observation at the Pimple and the Bois-en-Hache."

This wood was where the Prussian Guard, the 25th Grenadiers, had massed for a counter-attack and were attacked with great effect by a flock of our airmen using light bombs. The manoeuvre is rare, and never before, perhaps, has this form of attack against infantry been employed with such huge success."

Reuter's correspondent, writing on Saturday, records the following incident:—

"Yesterday morning our airmen were very active over the enemy positions of Bailleul, Vimy, and Petit Vimy. Through some cause, of which I have not heard the nature and which is really immaterial, one of our aeroplanes had to make a forced descent, and alighted well behind the German lines, near to Vimy. Staff officers, looking on from various observation posts, naturally expected to see a burst of machine-gun fire levelled against the lamed duck, and batteries were ordered to stand by to open upon the machine and destroy it as soon as the two occupants were clear of it; but the silence remained unbroken at this particular spot. The pilot and the observer clambered out and began walking towards our lines, beating their breasts to warm themselves, and no signs of any effort to molest them were perceived by the many watchers on the British side.

"Then the truth became evident. The garrisons had sneaked away during the night."

Another curious incident is mentioned by the *Times* correspondent on April 14th:—

"One of the curious incidents of the battle is that the Canadians, at a certain place, found in a dug-out and released two British airmen (whose names I cannot learn to-night), who were captured five days before. One was wounded and the other was put with him in a dug-out to look after him. Together with other things, they seem to have been forgotten in the enemy's flight, and they are now safe again."

Writing on the following day, he gives the following:—



AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British.

General Headquarters, April 10th.

"Our aeroplanes performed valuable work yesterday in co-operation with our infantry, and in a number of cases inflicted casualties with machine-gun fire on hostile reinforcements. Bombing expeditions were also carried out, in which a number of hits were obtained upon a large railway station utilised by the enemy, and three trains were wrecked. As a result of air fighting three German aeroplanes were destroyed and four others were forced down. One of our machines is missing."

General Headquarters, April 11th.

"Our aeroplanes were active again yesterday, and, in spite of a strong westerly gale and frequent snowstorms, performed valuable work in co-operation with our infantry. Few hostile machines were seen, and all our aeroplanes returned safely."

General Headquarters, April 12th.

"In spite of exceedingly bad weather for aerial work, our aeroplanes were active again yesterday, and seized every opportunity to harass hostile troops with machine-gun fire. During a short fine period one of our naval squadrons, while escorting British bombing machines, was heavily attacked by a number of hostile aeroplanes, and did exceptionally well. Without suffering any loss itself it destroyed three of the attacking machines, and drove down three others in a damaged condition. Altogether four German aeroplanes were brought down yesterday, and five others were driven down damaged. Six of our machines failed to return, and three others were brought down."

General Headquarters, April 13th.

"Much useful work was done by our aeroplanes yesterday, although the weather continued to be unfavourable for flying. The only hostile formation encountered was severely handled by one of our patrols, who drove down four of the enemy's machines out of control. One other hostile aeroplane was destroyed by us during the day. Three of our machines are missing."

General Headquarters, April 14th.

"Yesterday and during the night of the 12th inst. large quantities of explosives were dropped by our aeroplanes with good results on enemy stations, ammunition depôts and aerodromes, and hostile infantry and convoys were successfully attacked with machine-gun fire. In the course of air fighting behind the enemy's lines four German machines were brought down and six others driven down. Twelve of our machines failed to return."

"Every day one is filled with admiration for the performances of our airmen, and yesterday I watched them sailing unperturbed over the whole of the Lens area. From another direction, however, I hear of one of the most gallant deeds of this war. A solitary airman was returning from a distant trip when he was attacked by a large party of enemy machines. He fought till his ammunition was all exhausted, while making for home, himself and his machine being almost shot to bits. He had one eye literally shot out, a bullet in his body, and his foot smashed. His machine was riddled.

"In spite of all, he made his report, in which he apologised for making a rather rough landing because his smashed foot impaired control. Then, duty done, he died. No honour, whether the Victoria Cross or anything else, while it may recognise such a deed as this, can adequately measure it."

Four further anecdotes are given by the correspondent of the *Matin* on the British front, who says the flying services were splendid as usual:—

"The pilot and the observer of a squadron, a captain and a lieutenant respectively, pursued and twice dispersed two companies of Bavarian infantry, each 200 men strong.

"An air patrol fought 12 successive engagements near Douai. On its return two aeroplanes missed their way and found themselves in the thick of it above the enemy lines.

"One of them engaged from a height of 200 ft. a squadron of Pomeranian Hussars, killed about 20 of them, and dispersed the remainder. The other aeroplane, from the same altitude, used its machine-gun upon a squad of 100 Germans who were unloading trucks in a railway station, and exterminated the lot.

"Finally—a deed of unheard-of prowess—three aeroplanes flew along the main street of Lens on a level with the roofs, and liberally bombed a regiment of Bavarian infantry which was marching with swinging stride on the road of retreat."

War Office, April 14th.

"Salonica.—Our aircraft have carried out several successful raids, on one occasion causing considerable damage to an enemy aerodrome, and on another to an enemy dump. A double-engined enemy battleplane was driven down and its crew captured."

French.

Paris, April 10th.

"Salonica.—The British air service bombarded the enemy camps at Privista, in the zone of the Gulf of Orfano."

Paris, April 11th.

"Salonica.—Our fire compelled a squadron of 12 German aeroplanes to turn tail in the Vardar Valley."

Paris, April 13th.

"Salonica.—British aviators effectively bombarded the station of Porna."

Russian.

Petrograd, April 11th.

"In the region of Galatz a French aviator hit a German aeroplane, which fell, enveloped in flames, upon Galatz."

Petrograd, April 13th.

"In the region of the station of Pogoryitsy, on the Alexandroff Railway, a German aeroplane was brought down by Capt. Evsinkoff and Sub-Lieut. Tretiakoff. Our aviators carried out a flight over Gorokhoff (east of Sokal), and the adjoining railway line. Several scores of bombs were dropped. A squadron of German aeroplanes, consisting of 16 machines, made an unsuccessful attack upon our rear in the region of Monasterzyska."

Italian.

Rome, April 13th.

"This morning, at dawn, enemy aircraft dropped bombs on the pumping station at Codigoro without doing any damage."

German.

Berlin, April 12th.

"In spite of the gale there was much aerial activity. In the course of the air fighting the enemy lost 23 machines, and one aeroplane by infantry fire. Bombing attacks on enemy troop camps and ammunition dumps in the Vesle and Suippes valleys were observed to inflict damage. Capt. Baron von Richthofen shot down his 40th enemy machine."

Berlin, April 13th.

"During the night of April 10-11th one of our battle squadrons dropped 3½ tons of bombs on enemy barracks and an encampment near Fismes and Bazoches. Several hits and fires were observed. Reports from our advanced line referring to heavy and continuous explosions in the direction of Fismes confirm the results observed.

"Flight Commander Robinson was shot down on the 5th inst. by a German battle aviator."

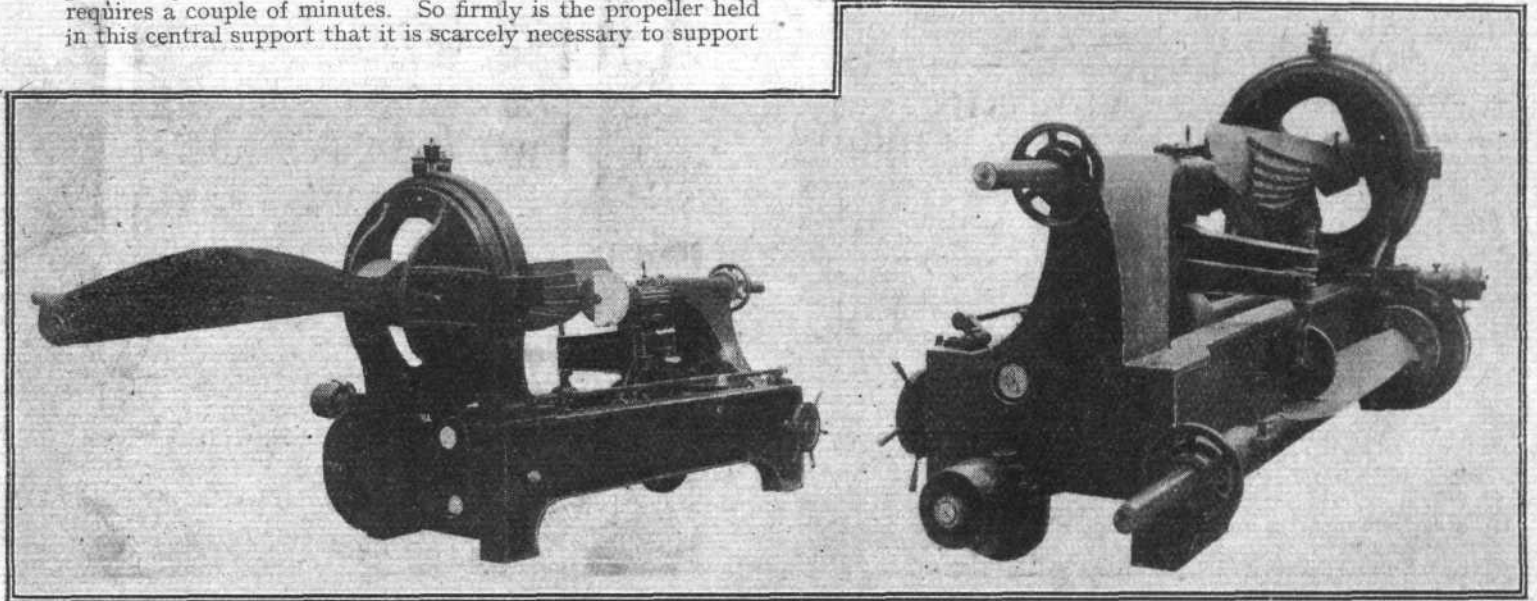
A NEW PROPELLER SHAPING MACHINE.

WHILE laminated wood propellers are being employed on aircraft the amount of work involved in making a propeller is very considerable, and as the degree of accuracy demanded is high it follows that, where made by hand, highly skilled labour is essential. At the present moment the supply of such labour is by no means unlimited, as any propeller manufacturer can testify, and therefore any machine which will perform a certain amount of the work that would otherwise have to be done by a skilled workman is entitled to consideration. Such a machine is the "Excelsus" propeller shaper illustrated in the accompanying photographs.

Fundamentally, the "Excelsus" is constructed on the well-known principle of the copying machine, but the design is so ingenious that it will reproduce either a two-bladed or a four-bladed propeller from a single-bladed metal pattern. The propeller to be shaped is supported by its boss from two projecting wings on the large driving cylinder. This is accomplished by means of a single bolt, and the operation only requires a couple of minutes. So firmly is the propeller held in this central support that it is scarcely necessary to support

is of the same length as the horizontal arm that carries the tracer wheel, the propeller will be shaped exactly to the dimensions of the pattern. The centre on which the two wheels oscillate consists of a threaded shaft of large diameter secured at each end to the main framework of the machine. This shaft forms the only sliding surface, and is, of course, perfectly true. On the spindle of the shaft of the cutter wheel is a worm which causes a nut carried by the central boss of the rocker bracket to revolve slowly on the threaded shaft, thus causing the cutter to travel the length of the propeller blade. By moving a lever on the vertical arm the feed speed can be varied, and an arrangement in the arm itself disengages the nut when it reaches the end of its traverse. A few turns of the hand wheel at the right hand end of the machine brings the cutter back to the tip end of the propeller, ready for shaping another blade.

The cutter wheel is driven from a pulley on a shaft inside



Front view of the "Excelsus" propeller shaping machine, showing cutter wheel and mounting of propeller in driving cylinder; and, on the right, rear view of the machine, showing metal pattern and tracer wheel.

the ends, but in order to guard against any ill effects of vibration of the extreme tips during machining these are firmly held in a thimble-shaped centre which revolves inside a ball thrust bearing. The centre is adjustable longitudinally so as to take propellers of different lengths.

The metal pattern to be copied is mounted on the opposite side of the machine, and is made to revolve at the same speed as the propeller by means of worms on a common driving shaft, the gearing being such that for every 60 revolutions of the shaft the propeller and pattern each make one revolution.

The cutter wheel and roller or tracer wheel are mounted on opposite arms of a rocker, and as both wheels are of the same diameter and the vertical arm carrying the cutter wheel

the frame. This pulley travels with the rocker bracket, and any accident to the belt instantly stops the traverse, so that no damage can be done to the blade being shaped. The whole operation of shaping a blade can, if desired, be done in one cut, and only takes from 40 to 60 minutes, according to the length of the blade. As the operation is exactly the same for each blade it follows that all blades are exactly alike in every respect, a feature difficult to attain by hand labour.

The "Excelsus" propeller shaping machine is designed and built by the Kerr Pattern Co., of Lincoln, from whom further particulars can be obtained, and who will be pleased to show the machine in operation to anyone interested.

Fatal Accidents.

Two aviators, one of whom was Lieut. J. A. Williamson, were killed in Leicestershire on April 10th. A machine was travelling very fast and high, when it suddenly started spiralling and descended rapidly. Something was observed to fall from the machine, which proved to be a passenger. The machine, with the pilot strapped to the seat, crashed into a field about 100 yards from where the passenger fell.

2nd Lieut. Hugh Howells, R.F.C., was flying an aeroplane at rather low altitude in an Eastern County on April 10th, when the machine fell, struck a corner of a building, and burst into flames. The officer was so badly burned that he died in a neighbouring military hospital during the night.

At a hospital in the Lincoln district on the 12th inst. an inquest was held on Capt. P. A. Kirkup, R.F.C. He was practising attacking at a great height when the machine got into a spin and crashed to the ground. Capt. Kirkup was an experienced pilot, and had flown in France as an observer. A verdict of "Accidental Death" was returned.

At Marylebone, on April 13th, an enquiry was held concerning the death of Capt. S. E. Lukyn, M.C., Royal W. Surrey Regt., who died in the R.F.C. Hospital, Bryanston Square, as the result of injuries received in an aeroplane accident.

The mother stated that her son had been learning flying for 10 days, and had been up on several occasions.

Major Macdonnell O'Malley said the greatest care was taken with every flying pupil, and only expert flyers were sent up to give instruction. Capt. Harrison, the pilot and instructor on this occasion, was an expert, with experience in France and in England. The machine in which he and Capt. Lukyn were flying was a brand new one, and had only been in use for 10 days. The enquiry was adjourned until June 4th for the attendance of Capt. Harrison, who is in hospital suffering from severe injuries.

Prominent German Pilots Killed.

REPORTS from Berlin state that Lieut. von Rendell, who succeeded Immelmann as the chief pilot of his squadron, was killed recently while attacking a French aeroplane over Cambrai. Lieut. Frankl, who was promoted by the Kaiser from the ranks last year when he had brought down four hostile machines, and was subsequently given the Order Pour le Merite, has been killed on the Western Front. First Lieut. Hans Berg is also reported to have been killed in a fight with two Allied machines. It was announced on Tuesday that Lieuts. Schulte and Baldamus had been killed in air fights over Cambrai.



THE SOCIETY OF BRITISH AIRCRAFT CONSTRUCTORS, LTD.

A MEETING of the Council of this Society will be held on Wednesday, April 25th, at 4 p.m., in the Library of the Aeronautical Society, 7, Albemarle Street, W. 1.

SIDE-WINDS.

FROM Simms Motor Units, Ltd., Percy Buildings, Grasse Street, Rathbone Place, W., comes a brochure dealing with the Simms British-made S.R. 4 and S.R. 6 magnetos. A brief description is given of the working and method of timing the machine, while not the least important section is that dealing with the maintenance in good running order of the magneto, and a diagram of connections is given. At the end there is a price list of spare parts, each separate part being illustrated and numbered to facilitate ordering. Anyone interested can secure a copy by writing to Simms Motor Units at the above address.

"WHAT'S in a name?" wrote Shakespeare, and although some of us may incline to the opinion that our parents might have displayed a little more discretion in selecting our names we are usually content to let matters rest. By an unfortunate slip of the pen in writing in our last issue of Mr. Geoffrey Ernest fiske, who has so successfully organised the aircraft department of Messrs. Boulton and Paul, of Norwich, his name was given as Mr. Henry fiske, which as a matter of fact is the name of his father. The name was correctly given below the photograph which appeared on the same page.

ESTABLISHED in 1854, the firm of Tubbs, Lewis and Co., of 29-30, Noble Street, E.C., are assuredly amongst the oldest and foremost now supplying elastic cord for absorbing the shock of landing aeroplanes. It is perhaps not too remote a connection to suppose that the combination of elasticity and strength required in health-exercising appliances of the "Sandow" type led on to the absorber as generally fitted to-day. Messrs. Tubbs, Lewis and Co. were making these muscle producers so long as twenty years ago, and no doubt found their investigations and experiments in search of the two necessary combined qualities mentioned above of inestimable value when called upon to produce the shock absorber cord for which they have now become famous. Employing over 1,000 hands, they were able on the outbreak of war, not only to supply the full needs of our own industry, but to export considerable quantities to our Allies. Naturally, since that time the demand for this material has gone up by leaps, but fortunately the firm are able to keep pace with the requirements in all strengths and diameters. In this direction official appreciation of the importance of this "accessory" ensures very prompt A.I.D. inspection, and manufacturers of aeroplanes can therefore rely upon the immediate filling of their orders. The firm's phone is "City 22," and the telegraphic address "Elastics, London."

THE spring offensive at the Bournemouth Flying School bids fair to be in full swing before long. With somewhere about thirty machines at their disposal, the three instructors, one of whom was a Service pilot until recently, should be able to keep a large batch of pupils on the go, especially when the new aerodrome, now nearly ready, is available. From the pupils' point of view one advantage of the Bournemouth school is that it is possible to obtain living accommodation at moderate terms quite close to the aerodrome, and the weather, on the whole, is good.

MR. G. H. BETTINSON, who is opening a flying school at Birmingham, announces that although he is installed in his hangars at King's Heath letters should still be addressed to him at Hall Green, Birmingham.

Telling the Bulgars.

THE French aviators down Salonica way are seeing to it that Bulgar soldiers are not altogether ignorant of events. As naturally the Bulgars are not told anything about the riots at Sofia and elsewhere, proclamations were printed and dropped in the enemy lines by the French aviators.

Zeppelins Out Again.

APPARENTLY the Zeppelins are emerging from their lairs again, telegrams from Bergen last week-end reporting that Zeppelins have been observed over the North Sea along the Norwegian coast during the previous few days.

UNAFFILIATED MODEL CLUBS DIARY AND REPORTS.

Club reports of chief work done are published monthly. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Finbury Park and District (29, ASHLEY ROAD, CROUCH HILL, N.).

MR. RAYNER (the Secretary) has now joined the R.F.C. as pilot, and he has the best wishes of all the members of the club. During his time as secretary he has helped the club in every way and some great improvements have taken place, not only in flying, but in the construction of models. The club, which was founded in August, 1913, has been active ever since, which, considering the war, shows great effort on the part of the secretaries and the members to keep a place in the model world.

Monthly Report.—During the past and present month the members of the Finbury Park and District Model Aero Club have been out on five occasions with tractor models. On the 17th the weather was not ideal for flying, being windy. Mr. Burchell was flying his 4-ft. model, making some fine high and steady flights. Mr. Coleman had out his old 'bus, and gave a display of wind fighting at a good height. Mr. Rayner brought out a new machine, which, after a little tuning up, showed great promise. Mr. Richards was present, but without a model. On the 24th the weather was once more in a normal state. Mr. Rayner's monoplane made a fine flight of about 450 yards at a good altitude. Mr. Coleman's model was putting up some of its usual good flights, and on one occasion landed on the North London Railway. Messrs. Richards and Burchell, Sen., were making good flights, the latter with his four-footer fitted with 18-in. propeller. His model also made some fine glides minus tractor screw and rubber of about 100 yards. On April 7th Mr. Coleman had a new model out, which made some fine flights, also good glides. In this model all metal parts are made of steel, and are fitted to the body with small bolts and nuts. The length of machine is 3 ft. 2 ins. overall, and the weight is 3½ ozs. Mr. Richards had out his old model and gave a display of banking. Mr. Burchell was flying a new light machine which made some high flights. Mr. Stansell's machine, fitted with one of Mr. Coleman's propellers, made some speedy flights. April 9th being windy, only three members were out with models. Mr. Richards brought out a 3 ft. 9 ins. model, which was fitted with 14-in. tractor screw, and gave very promising results. Mr. Coleman's machine was flying in its usual good style in spite of the wind. Mr. Stansell made one of his best flights with old model at a good altitude.

PUBLICATION RECEIVED.

Air-Power: Naval, Military, Commercial. By Claude Grahame-White and Harry Harper. London: Chapman and Hall. Price 7s. 6d. net.

NEW COMPANIES REGISTERED.

BROOKE ENGINEERING WORKS, LTD., Lawrence Buildings, Brooke Road, Stoke Newington, N.—Capital £5,000, in 4,500 preference shares of £1 each and 2,000 ordinary shares of 5s. each. Acquiring business of engineers, metal workers and aeroplane constructors carried on at Stoke Newington, N., as Brooke Motor and Engineering Works, Managing director: C. Sandys Ball.

THAMES AVIATION WORKS, LTD., 141, Curtain Road, E.C.—Capital £100, in 1s. shares. First and permanent director: J. R. Burton.

Aeronautical Patents Published.

Applied for in 1916.

- The numbers in brackets are those under which the Specifications are printed and abridged, &c.
Published April 19th, 1917.
- 3,964. SUNBEAM MOTOR CAR CO. and L. COATALEN. I.C. engines for aeroplanes. (104,897.)
 - 4,856. V. PASTORE and G. W. OWEN. Projectiles for use against aircraft. (104,944.)
 - 18,339. H. R. GUYOT. Cooling device for aircraft motors. (105,051.)

Index and Title Page for Vol. VIII.

The 8-page Index for Vol. VIII of "Flight" (January to December, 1916) is now ready, and can be obtained from the Publishers, 44, St. Martin's Lane, W.C. 2, Price 6d. per copy, post free.

If you require anything pertaining to aviation, study "FLIGHT'S" Buyers' Guide and Trade Directory, which appears in our advertisement pages each week.

FLIGHT.

44, ST. MARTIN'S LANE, LONDON, W.C.2.
Telegraphic address: Truditur, London.
Telephone: 1828 Gerrard.

SUBSCRIPTION RATES.

"FLIGHT" will be forwarded, post free, at the following rates:—

UNITED KINGDOM.			ABROAD.		
	s.	d.		s.	d.
3 Months, Post Free..	3	10	3 Months, Post Free	5	0
6 " " "	7	7	6 " " "	10	0
12 " " "	15	2	12 " " "	20	0

Cheques and Post Office Orders should be made payable to the Proprietors of "FLIGHT," 44, St. Martin's Lane, W.C. 2, and crossed London County and Westminster Bank, otherwise no responsibility will be accepted.

Should any difficulty be experienced in procuring "FLIGHT" from local news-vendors, intending readers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.